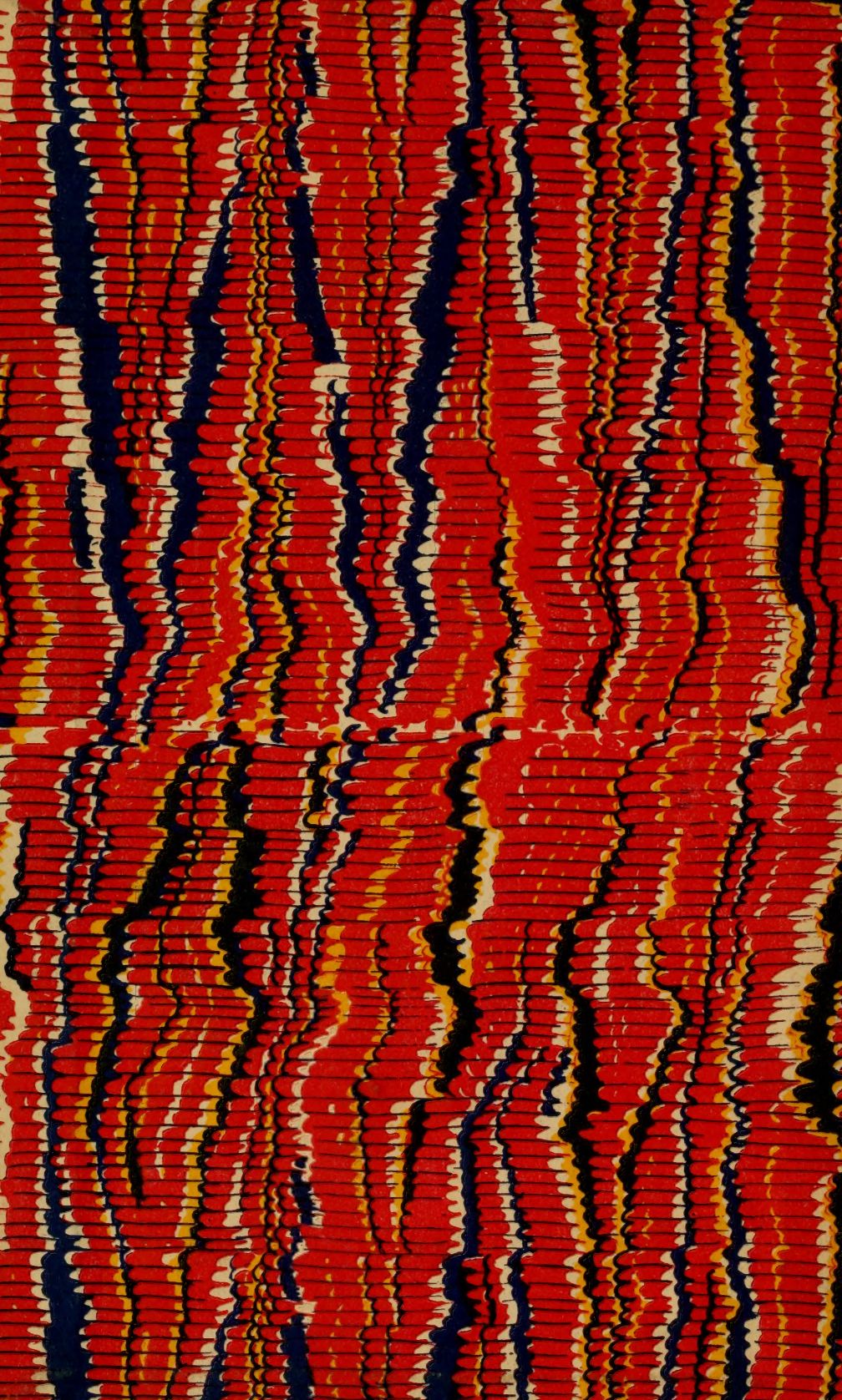
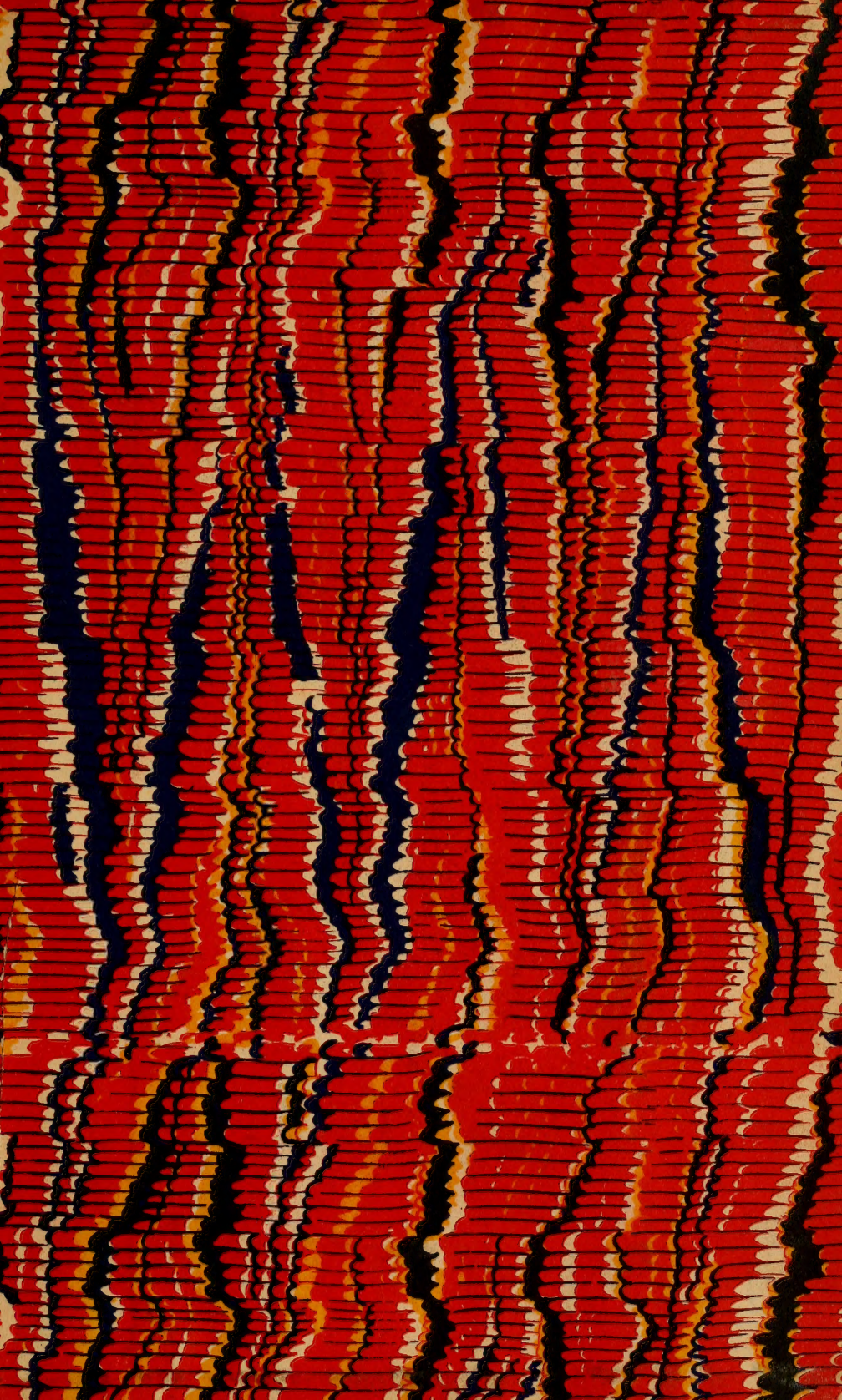






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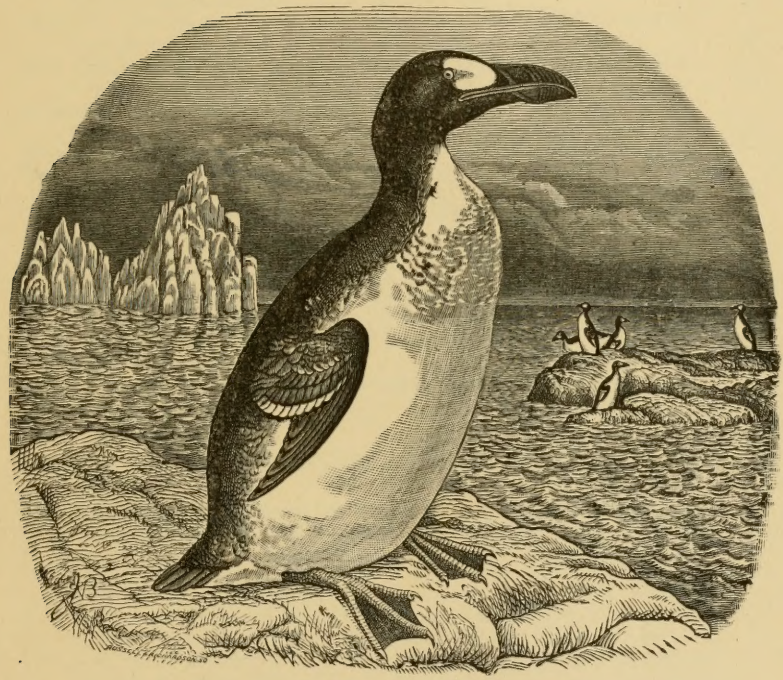
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IHERING, DR. HERMANN VON, Museu Paulista, Sao Paulo, Brazil.	1902
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KRUKENBERG, DR. E. F. W., Würzburg, Germany.	1884
KRÜPER, DR. THEOBALD J., University Museum, Athens, Greece.	1884
LEGGE, WILLIAM V., Cullenswood House, St. Mary's, Tasmania.	1891
MACFARLANE, ROBERT, Winnipeg, Manitoba.	1886
MADARÁSZ, DR. JULIUS VON, National Museum, Budapest, Hungary.	1884
MENZBIER, DR. M., Imperial Society of Naturalists, Moscow.	1884
NAMIYE, M., Tokio.	1886
NICHOLSON, FRANCIS, The Knoll, Windermere, England.	1884
NORTH, ALFRED J., Australian Museum, Sydney, New South Wales.	1902
OATES, EUGENE WILLIAM, 1 Carlton Gardens, Ealing, London, W.	1884
PALMIÉN, DR. J. A., Helsingfors, Finland.	1883
PYCRAFT, W. P., British Museum (Nat. Hist.), Cromwell Road, London, S. W.	1902
RAMSEY, E. P., Sydney, New South Wales.	1884
RINGER, FREDERIC, Nagasaki.	1888
ROTHSCHILD, HON. WALTER L., Zoölogical Museum, Tring, England.	1898
SCHALOW, HERMAN, 15 Schleswiger Ufer, Berlin, N. W.	1884
SCLATER, WILLIAM LUTLEY, Colorado Springs, Col.	1906
SHELLEY, CAPT. G. E., 39 Edgerton Gardens, South Kensington, London, S. W.	1884
SUSHKIN, DR. PETER, Imperial University, Moscow.	1903
THEEL, DR. HJALMAR, University of Upsala, Upsala, Sweden.	1884
TSCHUSI ZU SCHMIDHOFFEN, VICTOR RITTER VON, Villa Tännenhof, bei Hallein, Salzburg, Austria.	1884
WATERHOUSE, F. H., 3 Hanover Square, London, W.	1889
WINGE, DR. HERLUF, Copenhagen.	1903
WORCESTER, PROF. DEAN C., Manila, P. I.	1903
ZELEDON, DON JOSÉ C., San José, Costa Rica.	1884

MEMBERS

ALLEN, FRANCIS H., 4 Park St., Boston, Mass.	1901
ALLEN, DR. GLOYER M., 16 Oxford St., Cambridge, Mass.	1904
ALLISON, ANDREW, Ellisville, Miss.	1902
ATTWATER, H. P., Box 697, Houston, Texas.	1901

BAILEY, Mrs. VERNON, 1834 Kalorama Ave., Washington, D. C.	1901
BAILEY, VERNON, 1834 Kalorama Ave., Washington, D. C.	1901
BAILEY, WILLIAM L., Ardmore, Pa.	1901
BARBOUR, Prof. ERWIN H., Univ. of Nebraska, Lincoln, Neb.	1903
BARTSCH, PAUL, Smithsonian Inst., Washington, D. C.	1902
BEEBE, C. WILLIAM, N. Y. Zoölogical Park, New York City.	1903
BENT, ARTHUR C., Taunton, Mass.	1902
BOND, FRANK, 3127 Newark St., Cleveland Park, Washington, D. C.	1901
BRAISLIN, Dr. WILLIAM C., 556 Washington Ave., Brooklyn, N. Y.	1902
BROWN, HERBERT, Tucson, Arizona.	1901
BRUNER, Prof. LAWRENCE, Univ. of Nebraska, Lincoln, Neb.	1901
BRYAN, WILLIAM ALANSON, Bishop Museum, Honolulu, H. I.	1901
BURNS, FRANK L., Berwyn, Pa.	1901
BUTLER, AMOS W., 52 Downey Ave., Irvington, Indianapolis, Ind.	1901
CHERRIE, GEORGE K., Mus. Brooklyn Inst., Eastern Parkway, Brook- lyn, N. Y.	1901
CLARK, AUSTIN HOBART, U. S. National Museum, Washington, D. C.	1905
CLARK, Prof. HUBERT LYMAN, Museum of Comparative Zoölogy, Cam- bridge, Mass.	1902
DAGGETT, FRANK S., 441 Postal Telegraph Building, Chicago, Ill.	1901
DAWSON, WILLIAM LEON, 5528 15th Ave. N. E., Seattle, Wash.	1905
DEANE, WALTER, 29 Brewster St., Cambridge, Mass.	1901
DEARBORN, NED, Field Museum, Chicago, Ill.	1907
EATON, ELON HOWARD, Canandaigua, N. Y.	1907
EVERMANN, Prof. BARTON W., Bureau of Fisheries, Washington, D. C.	1901
FINLEY, WILLIAM L., Box 60A, R. F. D. I, Milwaukee, Ore.	1907
FLEMING, JAMES H., 267 Rusholme Road, Toronto, Ontario.	1901
FORBUSH, EDWARD H., Box 78, Wareham, Mass.	1903
FUERTES, LOUIS AGASSIZ, Cornell Heights, Ithaca, N. Y.	1901
GAULT, BENJAMIN TRUE, Glen Ellyn, Ill.	1903
GOLDMAN, EDWARD ALFONSO, Dept. of Agriculture, Washington, D. C.	1902
HARDY, MANLY, 159 Wilson St., Brewer, Maine.	1901
HOFFMANN, RALPH, 33 Wellington Ave., Belmont, Mass.	1901
HOWELL, ARTHUR H., Dept. of Agriculture, Washington, D. C.	1902
JACOBS, J. WARREN, 404 S. Washington St., Waynesburg, Pa.	1904
JEFFRIES, WILLIAM AUGUSTUS, 11 Pemberton Square, Boston, Mass.	1901
JOB, Rev. HERBERT K., Kent, Conn.	1901
JORDAN, Prof. DAVID STARR, Stanford University, Cal.	1901
KNIGHT, ORA WILLIS, 84 Forest Ave., Bangor, Me.	1907
KNOWLTON, F. H., U. S. Nat. Museum, Washington, D. C.	1902
MACKAY, GEORGE H., 304 Bay State Road, Boston, Mass.	1901
MAILLIARD, JOHN W., 300 Front St., San Francisco, Cal.	1901
MAILLIARD, JOSEPH, San Geronimo, Cal.	1901
MILLER, Mrs. OLIVE THORNE, Garvanza, Cal.	1901
MILLER, WALDRON DEWITT, Amer. Mus. Nat. Hist., New York City.	1906
MORRIS, GEORGE SPENCER, Olney, Philadelphia, Pa.	1903

MORRIS, ROBERT O., 72 Temple St., Springfield, Mass.....	1904
MURDOCH, JOHN, 19 Wendell St., Cambridge, Mass.....	1901
NORTON, ARTHUR H., Mus. Nat. Hist., 22 Elm St., Portland, Maine.....	1902
PEARSON, T. GILBERT, Greensboro, N. C.....	1902
PENNOCK, CHARLES J., Kennett Square, Pa.....	1901
PREBLE, EDWARD A., Dept. of Agriculture, Washington, D. C.....	1901
RATHBUN, SAMUEL F., 217 14th Ave., N., Seattle, Wash.....	1902
RHOADS, SAMUEL N., 36 Estaugh Ave., Haddonfield, N. J.....	1901
RILEY, JOSEPH H., Falls Church, Va.....	1905
RIVES, DR. WILLIAM C., 1702 Rhode Island Ave., Washington, D. C.....	1901
ROBINSON, MAJOR WIRT, U. S. A., West Point, N. Y.....	1901
SETON, ERNEST THOMPSON, Cos Cob, Conn.....	1901
SILLOWAY, PERLEY MILTON, Lewistown, Montana.....	1902
SORNBORGER, JEWELL D., Ipswich, Mass.....	1901
STEPHENS, FRANK, 3756 Park Boulevard, San Diego, Cal.....	1901
STRONG, DR. REUBEN M., Dept. Zool., Univ. of Chicago, Chicago, Ill.....	1903
THAYER, ABBOTT H., Monadnock, N. H.....	1901
THAYER, JOHN ELIOT, Lancaster, Mass.....	1905
TODD, W. E. CLYDE, Carnegie Museum, Pittsburgh, Pa.....	1901
TORREY, BRADFORD, Newton Lower Falls, Mass.....	1901
TOWNSEND, CHARLES H., Aquarium, Battery Park, New York City.....	1901
TOWNSEND, DR. CHARLES WENDELL, 76 Marlborough St., Boston, Mass.....	1905
TROTTER, DR. SPENCER, Swarthmore College, Swarthmore, Pa.....	1901
WAYNE, ARTHUR T., Mt. Pleasant, S. C.....	1906
WHITMAN, PROF. CHARLES OTIS, 5238 Woodlawn Ave., Chicago, Ill.....	1902
WOLCOTT, DR. ROBERT H., Univ. of Nebraska, Lincoln, Neb.....	1903
WRIGHT, MRS. MABEL OSGOOD, Fairfield, Conn.....	1901

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ABBOTT, CLINTON GILBERT, 153 W. 73rd St., New York City.....	1898
ADAMS, C. WALLACE, 947 Rhode Island Ave. N. W., Washington, D. C.....	1901
ADAMS, MISS EMILY BELLE, 167 Maple St., Springfield, Mass.....	1900
AIKEN, CHARLES EDWARD HOWARD, 2 E. Kiowa St., Colorado Springs, Colo.....	1898
AIKEN, HON. JOHN, Greenfield, Mass.....	1905
ALLEN, MISS EDITH, 310 W. Olive Ave., Redlands, Cal.....	1906
ALLEN, MRS. EUSTACE L., 859 Prospect Ave., Hartford, Conn.....	1904
ALLISON, WILLIAM B., 1320 St. Charles Ave., New Orleans, La.....	1905
AMES, J. H., 62 Charles St., Toronto, Ontario.....	1895
ANDERSON, MRS. J. C., Englewood, N. J.....	1903
ANDERSON, DR. RUDOLPH M., Blees Military Academy, Macon, Mo.....	1907
ANDREWS, ROY C., Amer. Mus. Nat. Hist., New York City.....	1906
ANGELL, WALTER A., 37 N. Main St., Providence, R. I.....	1901

ARCHBOLD, JOSEPH A., 107 Hodge Ave., Buffalo, N. Y.....	1903
ARMSTRONG, EDWARD E., 5219 Madison Ave., Chicago, Ill.....	1904
ARNOLD, EDWARD, 126 Van Buren St. West, Battle Creek, Mich.....	1894
ARNOW, ISAAC F., St. Marys, Ga.....	1903
ATKINSON, GEORGE E., Portage la Prairie, Manitoba.....	1903
BABSON, W. A., South Orange, N. J.....	1901
BAER, LYLE S., 304 W. Grant St., Streator, Ill.....	1907
BAGG, EGBERT, 424 Genesee St., Utica, N. Y.....	1883
BAILEY, HAROLD H., 321 54th St., Newport News, Va.....	1903
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BAKER, FRANK C., Chicago Acad. Sciences, Chicago, Ill.....	1907
BALDWIN, ROGER N., 1832 Carr St., St. Louis, Mo.....	1904
BALES, Dr. BLENN R., 151 N. Main St., Circleville, Ohio.....	1907
BALL, Mrs. BENNET F., Oakville, Conn.....	1905
BALL, Miss HELEN AUGUSTA, 43 Laurel St., Worcester, Mass.....	1893
BARBOUR, Rev. ROBERT, Y. M. C. A., Montclair, N. J.....	1902
BARBOUR, THOMAS, Mus. of Comp. Zoölogy, Cambridge, Mass.....	1903
BARNARD, Judge JOB, 1306 Rhode Island Ave., Washington, D. C.....	1886
BARNES, Hon. R. MAGOON, Lacon, Ill.....	1889
BARRY, Miss ANNA K., 5 Bowdoin Ave., Dorchester, Mass.....	1907
BARTON, FREDERICK MACD., Middlesex School, Concord, Mass.....	1907
BAXTER, GEORGE STRONG, Jr., 17 William St., New York City.....	1894
BEARD, DANIEL CARTER, 87 Bowne Ave., Flushing, N. Y.....	1887
BEAUPRE, EDWIN, Okotoks, Alberta.....	1905
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BEERS, HENRY W., 91 Denver Ave., Bridgeport, Conn.....	1895
BEHR, HERMAN, Jennings, Md.....	1907
BEHR, OTTO, Lopez, Pa.....	1907
BEICE, Capt. JOHN J., Oakville, Cal.....	1907
BENNETTS, WILLIAM J., 1941 1st St. N. W., Washington, D. C.....	1901
BENSON, LESLIE B., Port Jefferson, N. Y.....	1906
BERGTOLD, Dr. W. H., 1460 Clayton Ave., Denver, Colo.....	1889
BERIER, DE LAGNEL, Ridgwood, N. J.....	1885
BIDDLE, Miss EMILY WILLIAMS, 2201 Sansom St., Philadelphia, Pa.....	1898
BIGELOW, HENRY BRYANT, Lincoln, Mass.....	1897
BIGELOW, HOMER LANE, Old Orchard Road, Chestnut Hill, Mass.....	1902
BIGELOW, JOSEPH SMITH, Jr., Webster Atlas Bank, Sears Bldg., Boston, Mass.....	1896
BIGNELL, Mrs. EFFIE, 135 College Ave., New Brunswick, N. J.....	1899
BILDERSE, ISAAC, 213 W. 105th St., New York City.....	1907
BINGAMAN, W. H., Ash Creek, South Dakota.....	1906
BIRNIE, WILLIAM A., Box 14, Springfield, Mass.....	1904
BLACKWELDER, ELIOT, Univ. of Wisconsin, Madison, Wis.....	1895
BLAIN, Dr. ALEX. W., Jr., Harper Hospital, Detroit, Mich.....	1901

BLAKE, FRANCIS G., Box 97, Hanover, N. H.....	1901
BLAKE, MAURICE C., 15 Crosby Hall, Hanover, N. H.	1907
BLATCHLEY, W. S., 1530 Parke Ave., Indianapolis, Ind.....	1895
BLOOMFIELD, MRS. C. C., 723 Main St. W., Jackson, Mich.....	1901
BLUNT, Miss ELIZA SINCLAIR, Box 75, Elizabethtown, N. Y.....	1901
BOARDMAN, Miss E. D., 416 Marlborough St., Boston, Mass.....	1906
BOBB, C. L., cor. Williamson and Ingersoll Sts., Madison, Wis.....	1907
BOEWE, MAX, 15 King St., Taunton, Mass.....	1903
BOGERT, WILLIAM S., Box 53, Leonia, N. J.....	1904
BOHLMAN, HERMAN T., 46 Ninth St. N., Portland, Oregon.....	1901
BOND, HARRY L., Lakeland, Minn.....	1890
BOSSON, CAMPBELL, 723 Tremont Bldg., Boston, Mass.....	1906
BOWDISH, B. S., Demarest, N. J.....	1891
BOWDISH, Mrs., B. S., Demarest, N. J.....	1902
BOWDITCH, HAROLD, Pond St., Jamaica Plain, Mass.....	1900
BOWLES, JOHN HOOPER, 401 S. G St., Tacoma, Wash.....	1891
BOYD, ERNEST, 4276 Cook Ave., St. Louis, Mo.....	1906
BRACKEN, Mrs. HENRY MARTYN, 1010 Fourth St. S. E., Minneapolis, Minn.....	1897
BRADFORD, Mrs. J. L., Morris Building, New Orleans, La.....	1897
BRADFORD, MOSES B. L., Concord Public Library, Concord, Mass..	1889
BRADLEE, THOMAS STEVENSON, Somerset Club, Boston, Mass.....	1902
BRANDRETH, COURTENAY, Cliff Cottage, Ossining, N. Y.....	1905
BRANDRETH, FRANKLIN, Cliff Cottage, Ossining, N. Y.....	1889
BREWSTER, EDWARD EVERETT, 316 East C St., Iron Mountain, Mich.	1893
BRIDGE, Mrs. EDMUND E., 52 Wyman St., West Medford, Mass.....	1902
BRIGHT, Miss ANNA L., Green Hill Farm, Overbrook, Pa.....	1903
BRINLEY, H. H., Raleigh, N. C.....	1904
BROCK, Dr. HENRY HERBERT, 687 Congress St., Portland, Me.....	1894
BROCKWAY, ARTHUR WILLIAM, Hadlyme, Conn.....	1906
BROOKS, ALLAN, Okanagan Landing, B. C.....	1902
BROOKS, WINTHROP S., Adams St., Milton, Mass.....	1907
BROOKS, Rev. EARLE AMOS, Weston, W. Va.....	1892
BROWN, D. E., 949 24th Ave., Seattle, Wash.....	1906
BROWN, EDWARD J., Lemon City, Florida.....	1891
BROWN, HUBERT H., 100 Gothic Ave., Toronto Junction, Ontario..	1889
BROWN, STEWARDSON, 20 E. Penn St., Germantown, Philadelphia, Pa.	1895
BROWNSON, W. H., Superintendent of Schools, Portland, Me.....	1903
BRYANT, OWEN, Cohasset, Mass.....	1903
BUCHANAN, C. S., New Haven, Mo.....	1906
BUCK, HENRY ROBINSON, 18 Girard Ave., Hartford, Conn.....	1897
BUMPUS, Dr. HERMON C., Am. Mus. Nat. Hist., New York City.....	1901
BURGESS, JOHN KINGSBURY, Chestnut St., Dedham, Mass.....	1898
BURKE, WM. BARDWELL, 130 Spring St., Rochester, N. Y.....	1901
BURNETT, WILLIAM L., Box 483, Loveland, Colo.....	1895
BURNEY, THOMAS L., 83 New Park St., Lynn, Mass.....	1905

BURR, FREEMAN F., 39 Thompson Ave., East Haven, Conn.....	1907
BURTCH, VERDI, Branchport, N. Y.....	1903
BUTLER, Miss CHARLOTTE W., 75 Cabot St., Beverly, Mass.....	1904
BUTLER, ERNEST A., 3417 N. 19th St., Philadelphia, Pa.....	1906
BUTTRICK, PHILIP L., 296 Columbus Ave., New Haven, Conn.....	1907
BUXBAUM, Mrs. CLARA E., St. Joseph, Mich.....	1895
CABOT, LOUIS, Brookline, Mass.....	1904
CADY, Mrs. JOHN H., 127 Power St., Providence, R. I.....	1905
CALLENDER, JAMES PHILLIPS, 603 Springfield Ave., Summit, N. J.....	1903
CAMERON, E. S., Fallon, Montana.....	1903
CAMPBELL, Mrs. ROBERT, 280 Wildwood Ave., Jackson, Mich.....	1905
CARPENTER, Rev. CHARLES KNAPP, 183 Fox St., Aurora, Ill.....	1894
CARPENTER, GEORGE I., 696 Halsey St., Brooklyn, N. Y.....	1907
CARRIKER, M. A., Jr., Carnegie Museum, Pittsburgh, Pa.....	1907
CARROLL, JAMES M., S. M. Baptist Academy, San Marcos, Tex.....	1905
CARTER, JOHN D., Lansdowne, Pa.....	1907
CASE, Rev. BERT F., Middle Haddam, Conn.....	1903
CASE, CLIFFORD M., 100 Ashley St., Hartford, Conn.....	1892
CASH, HARRY A., 54 Spring St., Pawtucket, R. I.....	1898
CATLIN, JAMES P., Ottawa, Ill.....	1905
CHADBOURNE, Mrs. A. P., Box 114, Back Bay P. O., Boston, Mass.....	1907
CHAMBERLAIN, CHAUNCEY W., 36 Lincoln St., Boston, Mass.....	1885
CHAMBERS, W. LEE, Santa Monica, Cal.....	1907
CHANNEY, RALPH W., 6046 Woodlawn Ave., Chicago, Ill.....	1907
CHAPIN, Prof. ANGIE CLARA, 25 Freeman Cottage, Wellesley, Mass.....	1896
CHAPIN, JAMES, 623 W. 142d St., New York City.....	1906
CHAPMAN, Dr. E. A., 107 E. 23rd. St., New York City.....	1905
CHASE, Mrs. AGNES, 1350 F St. N. E., Washington, D. C.	1896
CHASE, SIDNEY, Nantucket, Mass.....	1904
CHRISTY, BAYARD H., 403 Frederick Ave., Sewickley, Pa.....	1901
CHUBB, SAMUEL H., Amer. Mus. Nat. Hist., New York City.....	1894
CLARK, B. PRESTON, 55 Kilby St., Boston, Mass.....	1907
CLARK, EDWARD B., 341 Oak St., Chicago, Ill.....	1900
CLARK, Miss EMILY L., 103 Main St., St. Johnsbury, Vt.....	1905
CLARK, JOSIAH H., 238 Broadway, Paterson, N. J.....	1895
CLARK, Miss SUSAN E., 103 Main St., St. Johnsbury, Vt.....	1905
CLARKE, Dr. CHARLES K., Toronto Asylum, Toronto, Ont.....	1902
CLARKE, Miss HARRIET E., 9 Chestnut St., Worcester, Mass.....	1896
CLARKE, ROWENA A., Kirkwood Station, St. Louis, Mo.....	1906
CLEAVES, HOWARD H., Princes Bay, Staten Island, N. Y.....	1907
CLEVELAND, Miss LILIAN, Woods Edge Road, West Medford, Mass.....	1906
CLEVELAND, Dr. CLEMENT, 59 W. 38th St., New York City.....	1903
COALE, HENRY K., Highland Park, Ill.....	1883
COFFIN, Miss LUCY V. BAXTER, 3232 Groveland Ave., Chicago, Ill.....	1905
COGGINS, HERBERT LEONARD, 5025 McKean Ave., Germantown, Philadelphia, Pa.....	1898

COLBURN, ALBERT E., 1204 S. Main St., Los Angeles, Cal.....	1891
COLVIN, WALTER S., Box 121, Osawatomie, Kan.....	1896
COMEAU, NAPOLEON A., Godbout, Quebec.....	1885
COMEX, ARTHUR C., care F. L. Scholl, R. F. D. 3, Dixon, Ill.....	1901
COMMONS, MRS. F. W., 2437 Park Ave., Minneapolis, Minn.....	1902
CONANT, MRS. THOS. O., 243 W. 98th St., New York City.....	1901
COOK, MISS LILIAN GILLETTE, 165 W. 82d St., New York City.....	1899
COPE, ALBAN, Butler Hospital, Providence, R. I.....	1885
COPE, FRANCIS R., Jr., E. Washington Lane, Germantown, Pa.....	1892
COPELAND, DR. ERNEST, 302 Goldsmith Bldg., Milwaukee, Wis.....	1897
COPELAND, MANTON, 40 Winthrop St., Taunton, Mass.....	1900
COURT, EDWARD J., U. S. Geol. Survey, 1330 F St. N. W., Wash- ton, D. C.....	1907
COX, ULYSSES O., 433 Washington Ave., Terre Haute, Ind.....	1894
CRAM, R. J., 26 Hancock Ave. W., Detroit, Mich.....	1893
CRANDALL, C. W., 10 Third St., Woodside, N. Y.....	1891
CRANE, MISS CLARA L., Dalton, Mass.....	1904
CRANE, MRS. ZENAS, Dalton, Mass.....	1904
CROLIUS, MISS ANNE A., 815 Carnegie Hall, New York City.....	1897
CROMWELL, JAMES W., Box 246, Summit, N. J.....	1904
CRONE, JOHN VALETINE, Greeley, Colo.....	1902
CROSBY, MAUNSELL S., Grasmere, Rhinebeck, N. Y.....	1904
CUMMINGS, MISS EMMA G., 16 Kennard Road, Brookline, Mass.....	1903
CURL, H. C., New Naval Hospital, Washington, D. C.....	1907
CURRIE, ROLLA P., Dept. of Agriculture, Washington, D. C.....	1895
CURRIER, EDMONDE SAMUEL, Box 21, St. Johns, Ore.....	1894
DART, DR. LESLIE O., Hotel Summers, Minneapolis, Minn.....	1898
DAVENPORT, MRS. ELIZABETH B., 45 Green St., Brattleboro, Vt.....	1898
DAVID, F. M., Damariscotta, Me.....	1905
DAVIS, CHARLES H., 515 Michigan Ave., Saginaw, Mich.....	1906
DAVIS, MISS ELIZABETH D., 43 Appleton Ave., Pittsfield, Mass.....	1906
DAVIS, MISS MARY A., 26 W. 97th St., New York City.....	1898
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DAVIS, STEWART, Narragansett Pier, R. I.....	1899
DAVISON, DONALD B., 204 Prospect Terrace, Davenport, Iowa.....	1901
DAY, CHESTER SESSIONS, 15 Chilton Road, West Roxbury, Mass.....	1897
DAY, FRANK MILES, Mt. Airy, Philadelphia, Pa.....	1901
DEANE, GEORGE CLEMENT, 80 Sparks St., Cambridge, Mass.....	1899
DE HAVEN, ISAAC NORRIS, Box 61, Ardmore, Pa.....	1893
D'EVELYN, DR. FREDERICK W., 2103 Clinton Ave., Alameda, Cal.....	1907
DENNIS, DAVID W., Richmond, Ind.....	1907
DERBY, RICHARD, 113 E. 71st St., New York City.....	1898
DEVINE, J. L., 5478 Ellis Ave., Chicago, Ill.....	1903
DEWEY, DR. CHARLES A., 78 Plymouth Ave., Rochester, N. Y.....	1900
DEWING, THOMAS W., 82 E. 55th St., New York City.....	1907
DICKEY, DONALD R., 8 College St., New Haven, Conn.....	1907

DICKEY, SAMUEL S., 31 S. West St., Waynesburg, Pa.....	1905
DILLE, FREDERICK M., 2927 W. 28th Ave., Denver, Colo.....	1892
DIONNE, C. E., Laval Univ., Quebec.....	1893
DIXON, FREDERICK J., Elm Ave., Hackensack, N. J.....	1891
DOBBIN, WILLIAM L., 43 Beverley St., Rochester, N. Y.....	1902
DODGE, CHARLES W., Univ. of Rochester, Rochester, N. Y.....	1900
DODGE, FRED CLINTON, 125 Milk St., Boston, Mass.....	1897
DODGE, JULIAN M., Wenham, Mass.....	1903
DOGGETT, ALLEN B., Jr., Dartmouth College, Hanover, N. H.....	1906
DOOLITTLE, E. A., Box 34, Painesville, Ohio.....	1905
DOUBLEDAY, MRS. FRANK NELSON, Mill Neck, Long Island, N. Y....	1897
DOUGHERTY, Gen. WILLIAM E., 1409 E. 14th St., Fruitvale, Cal.....	1890
DREW, Miss EMMA E., 82 Grant St., Burlington, Vt.....	1904
DROWNE, Dr. FREDERICK PEABODY, Chilesburg, Caroline Co., Va....	1899
DRUMMOND, Miss MARY, 208 West St., Wheaton, Ill.....	1904
DUBOIS, ALEX. DAWES, 327 S. Glenwood Ave., Springfield, Ill.....	1905
DUGMORE, ARTHUR RADCLYFFE, Newfoundland, N. J.....	1899
DULL, MRS. A. P. L., 211 N. Front St., Harrisburg, Pa.....	1900
DUNBAR, W. LINFRED, Union Metallic Cartridge Co., Bridgeport, Conn.....	1906
DURFEE, OWEN, Box 125, Fall River, Mass.....	1887
DUTCHER, Capt. BASIL HICKS, U. S. A., Field Ave., Plainfield, N. J.:	1886
DYCHE, Prof. L. L., Lawrence, Kansas.....	1886
DYKE, ARTHUR CURTIS, Bridgewater, Mass.....	1902
EASTGATE, ALFRED, Harrisburg, Nelson Co., N. D.....	1906
EASTMAN, HARRY D., Framingham, Mass.....	1891
EDSON, JOHN M., 2210 Victor St., Bellingham, Wash.....	1886
EDWARDS, STANLEY W., 36 Pearl St., Hartford, Conn.....	1907
EHINGER, Dr. CLYDE E., 15 Normal Ave., West Chester, Pa.....	1904
EICHE, AUGUST, 1133 O St., Lincoln, Neb.....	1902
EIFRIG, Rev. C. W. GUSTAVE, 210 Wilbrod St., Ottawa, Ont.....	1901
EIMBECK, Dr. A. F., New Haven, Mo.....	1906
ELLS, GEORGE P., Norwalk, Conn.....	1904
ELROD, Prof. MORTON J., 205 S. 5th St. East, Missoula, Montana...	1892
ELY, Mrs. THEODORE N., Bryn Mawr, Pa.....	1901
EMBODY, GEORGE CHARLES, Randolph-Macon College, Ashland, Va.:	1898
EMMET, ROBERT T., New Rochelle, N. Y.....	1904
EMORY, MRS. MARY DILLE, 156 Foundry St., Morgantown, W. Va....	1899
ENDERS, JOHN O., Box 546, Hartford, Conn.....	1904
ERICSON, LAWRENCE E., 155 Rogers Ave., Brooklyn, N. Y.....	1901
ESSICK, WILLIAM S., 536 Penn St., Reading, Pa.....	1906
EUSTIS, RICHARD S., 17 Highland St., Cambridge, Mass.....	1903
EVANS, WILLIAM B., 205 E. Central Ave., Moorestown, N. J.....	1897
EVERETT, WILLIAM M., 200 W. 99th St., New York City.....	1902
FARLEY, JOHN A., 105 Summer St., Malden, Mass.....	1904
FARR, MARCUS S., Princeton University, Princeton, N. J.....	1900

FARWELL, MRS. FRANCIS COOLEY, Edgewood, Lake Forest, Ill.....	1898
FARWELL, MRS. JOHN V., Jr., Ardleigh, Lake Forest, Ill.....	1896
FAY, S. PRESCOTT, 169 Commonwealth Ave., Boston, Mass.....	1907
FELGER, ALVA HOWARD, North Side High School, Denver, Colo....	1898
FELL, Miss EMMA TREGO, Holicong, Pa.....	1903
FERRY, JOHN FARWELL, Field Museum of Nat. Hist., Chicago, Ill....	1894
FIELD, EDWARD B., 616 Andrews Bldg., Minneapolis, Minn.....	1898
FISHER, Miss ELIZABETH WILSON, 1502 Pine St., Philadelphia, Pa....	1896
FISHER, WALTER T., 463 N. State St., Chicago, Ill.....	1907
FISHER, WILLIAM HUBBELL, 13 Wiggins Block, Cincinnati, Ohio....	1883
FLANAGAN, JOHN H., 392 Benefit St., Providence, R. I.....	1898
FLETCHER, MRS. MARY E., Proctorsville, Vt.....	1898
FOOTE, Miss F. HUBERTA, 90 Locust Hill Ave., Yonkers, N. Y.....	1897
FORBES, HENRY S., Milton, Mass.....	1904
FORD, EDWIN S., 71 Washington St., Morristown, N. J.....	1907
FORDYCE, GEO. L., 40 Lincoln Ave., Youngstown, Ohio.....	1901
FORSYTH, DOUGLAS, Box 1808, New Orleans, La.....	1906
FOWLER, FREDERICK HALL, 221 Kingsley Ave., Palo Alto, Cal.....	1892
FOWLER, HENRY W., Acad. Nat. Sciences, Philadelphia, Pa.....	1898
FOX, Dr. WILLIAM H., 1826 Jefferson Place, Washington, D. C.....	1883
FRANKLIN, DWIGHT, Amer. Mus. Nat. Hist., New York City.....	1907
FRASER, DONALD, Johnstown, N. Y.....	1902
FREEMAN, Miss HARRIET E., 37 Union Park, Boston, Mass.....	1903
FRENCH, CHARLES H., Canton, Mass.....	1904
FULLER, CLARENCE T., 56 Lefferts Place, Brooklyn, N. Y.....	1907
FULLER, T. OTIS, Needham, Mass.....	1904
FUTCHER, Dr. THOMAS B., 3 W. Franklin St., Baltimore, Md.....	1906
GANO, Miss LAURA, Earlham Place, Richmond, Ind.....	1903
GARDINER, CHARLES BARNES, 5 Minard Place, Norwalk, Ohio.....	1903
GARRICK, JAMES P., Jr., Weston, Richmond Co., S. C.....	1906
GATH, JOHN, Box 236, Torrington, Conn.....	1901
GIBSON, LANGDON, 18 Washington Ave., Schenectady, N. Y.....	1904
GIFFORD, EDWARD WINSLOW, Cal. Acad. Sci., San Francisco, Cal....	1904
GILMAN, M. FRENCH, Sacaton, Arizona.....	1907
GOODALE, Dr. JOSEPH LINCOLN, 258 Beacon St., Boston, Mass.....	1885
GOODRICH, JULIET T., 10 Astor St., Chicago, Ill.....	1904
GOODWIN, Miss AMELIA M., 10 Follen St., Cambridge, Mass.....	1904
GOSS, MRS. ALETTA W., 5475 Ridgewood Court, Chicago, Ill.....	1902
GOULD, JOSEPH E., 5 Clifton St., Norfolk, Va.....	1889
GRANGER, Miss HELEN, Pierce Hall, Cambridge, Mass.....	1904
GRANGER, WALTER W., Amer. Mus. Nat. Hist., New York City....	1891
GRAVES, MRS. CHARLES B., 66 Franklin St., New London, Conn.....	1905
GREENOUGH, MRS. AMELIA P., 377 Beacon St., Boston, Mass.....	1904
GREENOUGH, HENRY VOSE, 45 Carlton St., Brookline, Mass.....	1901
GREGORY, STEPHEN S., Jr., 89 Astor St., Chicago, Ill.....	1906

GRIFFING, MOSES BOWDITCH, Shelter Island Heights, N. Y.....	1897
GROSS, ALFRED O., Nat. Hist. Bldg., Univ. of Illinois, Urbana, Ill....	1907
HADLEY, ALDEN H., Melbourne, Fla.....	1906
HALES, HENRY, Ridgewood, N. J.....	1890
HALL, H. PORTER, Leominster, Mass.....	1904
HAMFELDT, A., The Ware Times, Ware, Ia.....	1892
HANKINSON, THOMAS LEROY, Charleston, Ill.....	1897
HANN, HERBERT H., 700 Springfield Ave., Summit, N. J.....	1903
HARDON, Mrs. HENRY W., 315 West 71st St., New York City.....	1905
HARDY, JOHN H., Jr., 24 Irving St., Arlington, Mass.....	1905
HARPER, FRANCIS, 557 First Ave., College Point, N. Y.....	1907
HARRIMAN, Miss MARY, 1 E. 55th St., New York City.....	1899
HARVEY, J. DOWNEY, 2555 Webster St., San Francisco, Cal.....	1906
HARVEY, Miss RUTH SAWYER, Bond Hill, Cincinnati, Ohio.....	1902
HASKELL, Miss HELEN P., 1207 Henry St., Alton, Ill.....	1905
HATHAWAY, HARRY S., Box 498, Providence, R. I.....	1897
HAVEMEYER, H. O., Jr., 113 Wall St., New York City.....	1893
HAYES, Miss PAULINE J., 212 S. Sycamore St., Centralia, Ill.....	1907
HAZARD, Hon. R. G., Peace Dale, R. I.....	1885
HEAD, Miss ANNA, 2538 Channing Way, Berkeley, Cal.....	1903
HEALEY, Rev. SULLIVAN SCOTT, Pullman, Wash.....	1906
HELME, ARTHUR H., Miller Place, N. Y.....	1888
HEMPHILL, ASHTON E., Y. M. C. A., Holyoke, Mass.....	1905
HENCHLEY, MICHAEL F., Box 252, Unionville, Conn.....	1906
HENDERSON, Judge JUNIUS, Boulder, Colo.....	1903
HENDRICKSON, W. F., 276 Hillside Ave., Jamaica, N. Y.....	1885
HENNING, CARL FRITZ, 922 8th St., Boone, Ia.....	1906
HENNINGER, Rev. WALTHER F., New Bremen, Ohio.....	1898
HERRICK, HAROLD, 25 Liberty St., New York City.....	1905
HIGBEE, HARRY G., 13 Austin St., Hyde Park, Mass.....	1900
HILL, A. C., 400 Pleasant St., Belmont, Mass.....	1905
HILL, JAMES HAYNES, Box 485, New London, Conn.....	1897
HILL, Mrs. THOMAS R., 4629 Baltimore Ave., Philadelphia, Pa....	1903
HINE, Prof. JAMES STEWART, Ohio State Univ., Columbus, Ohio....	1899
HINE, Mrs. JANE L., Sedan, Ind.....	1890
HINTON, Miss SUSAN McV., 41 W. 32d St., New York City.....	1900
HITCHCOCK, FRANK H., Cosmos Club, Washington, D. C.....	1891
HIX, GEORGE E., 630 Columbus Ave., New York City.....	1904
HODGE, Prof. CLIFTON FREMONT, Clark Univ., Worcester, Mass....	1899
HOLBROOK, Miss ISABEL B., Rhode Island Normal School, Providence, R. I.....	1905
HOLDEN, Mrs. EMELINE R., 13 E. 79th St., New York City.....	1902
HOLDEN, Mrs. EDWIN B., 323 Riverside Drive, New York City....	1903
HOLLAND, Dr. WILLIAM J., 5th and Bellefield Aves., Pittsburgh, Pa.	1899
HOLLISTER, NED, Biological Survey, Washington, D. C.....	1894

HOLLISTER, WARREN D., Albuquerque, N. M.....	1901
HOLMAN, RALPH H., 50 Congress St., Boston, Mass.....	1907
HOLT, ERNEST G., Y. M. C. A., Montgomery, Ala.....	1907
HONYWILL, ALBERT W., Jr., 53 Lake Place, New Haven, Conn....	1907
HORSFALL, BRUCE, 67 Wiggins St., Princeton, N. J.....	1905
HOWARD, J. STANLEY, Box 52, Silver Lake Assembly, N. Y.....	1904
HOWARD, OZORA WILLIAM, Box 1177, Los Angeles, Cal.....	1898
HOWELL, BENJAMIN F., Jr., R. F. D. No. 1, Boonton, N. J.....	1907
HOWE, CARLTON D., Essex Junction, Vt.....	1901
HOWE, REGINALD HEBER, Jr., Middlesex School, Concord, Mass....	1895
HOWLAND, RANDOLPH H., 164 Wildwood Ave., Upper Montclair, N. J.	1903
HOYT, WILLIAM H., Box 425, Stamford, Conn.....	1907
HUBBARD, DR. LUCIUS L., Houghton, Mich.....	1907
HUBBARD, MRS. SARA A., 177 Woodruff Ave., Brooklyn, N. Y.....	1891
HUBEL, FREDERICK C., Clarkston, Mich.....	1903
HUNN, JOHN T. SHARPLESS, 1218 Prospect Ave., Plainfield, N. J....	1895
HUNT, CHRESWELL J., 225 N. 53rd St., West Philadelphia, Pa.....	1902
HUNTER, W. D., Box 208, Dallas, Texas.....	1899
INGALLS, CHARLES E., East Templeton, Mass.....	1885
INGERSOLL, ALBERT M., 832 5th St., San Diego, Cal.....	1885
IRVING, JOHN, 550 Park Av., New York City.....	1894
ISHAM, C. B., 30 E. 63d St., New York City.....	1891
JACKSON, THOMAS H., 304 N. Franklin St., West Chester, Pa.....	1888
JAGER, H. J., 222 State Ave., Owatonna, Minn.....	1904
JENNEY, CHARLES F., 35 Congress St., Boston, Mass.....	1905
JOHNSON, FRANK EDGAR, 16 Amackassin Terrace, Yonkers, N. Y....	1888
JOHNSON, JAMES HOWARD, Bradford, N. H.....	1894
JOHNSON, WALTER ADAMS, 18 Gramercy Park, New York City.....	1898
JOHNSON, WILLIAM S., Boonville, N. Y.....	1893
JONAS, Miss ANNA C., 383 Erskine St., Detroit, Mich.....	1906
JORDAN, A. H. B., Everett, Wash.....	1888
JUDD, ELMER T., Cando, N. D.....	1895
JUDD, H. CORNELIUS, Bethel, Conn.....	1906
JUDD, ROBERT S., Bethel, Conn.....	1906
JUDSON, CLAY, 258 Knapp St., Milwaukee, Wis.....	1906
KEAYS, JAMES EDWARD, 328 St. George St., London, Ontario.....	1899
KEIM, THOMAS DANIEL, 405 Radcliffe St., Bristol, Pa.....	1902
KELKER, WILLIAM A., Box 114, Harrisburg, Pa.....	1896
KELLOGG, Prof. VERNON L., Stanford University, Cal.....	1888
KENDALL, Miss BLANCHE, 20 Dudley St., Brookline, Mass.....	1904
KENNARD, FREDERIC HEDGE, Dudley St., Newton Centre, Mass....	1892
KENT, EDWIN C., 90 West St., New York City.....	1907
KERMODE, FRANCIS, Curator Provincial Museum, Victoria, B. C....	1904
KEYES, Prof. CHAS. R., Mt. Vernon, Ia.....	1904
KIDDER, NATHANIEL T., Milton, Mass.....	1906
KILGORE, WILLIAM, Jr., 2634 Fremont Ave. N, Minneapolis, Minn..	1906

KING, LE ROY, 20 E. 84th St., New York City.....	1901
KIRKHAM, MRS. JAMES W., 275 Maple St., Springfield, Mass.....	1904
KIRKWOOD, FRANK C., Oldtown, Alleghaney Co., Md.....	1892
KLUGH, A. B., 7 Wellington St., Kingston, Ont.....	1904
KNAEBEL, ERNEST, 1040 Josephine St., Denver, Colo.....	1906
KNAPP, MRS. HENRY A., 301 Quincy Ave., Scranton, Pa.....	1905
KNOLHOFF, FERDINAND WILLIAM, 28 Winans St., East Orange, N. J.....	1897
KOPMAN, HENRY HAZLITT, Biloxi, Miss.....	1899
KUTCHIN, DR. VICTOR, Green Lake, Wis.....	1905
LACEY, HOWARD GEORGE, Kerrville, Texas.....	1899
DELAGERBERG, AXEL J., 70 Park Ave., Passaic, N. J.....	1907
LANG, HERBERT, Amer. Mus. Nat. Hist., New York City.....	1907
LANTZ, PROF. DAVID ERNEST, Dept. of Agriculture, Washington, D. C.....	1885
LARRABEE, AUSTIN P., 630 Lytton Ave., Palo Alto, Cal.....	1902
LATIMER, MISS CAROLINE P., 19 Pierrepont St., Brooklyn, N. Y.....	1898
LAURENT, PHILIP, 31 E. Mt. Airy Ave., Mt. Airy, Philadelphia, Pa.....	1902
LAW, J. EUGENE, Hollywood, Cal.....	1907
LAWRENCE, JOHN B., 126 E. 30th St., New York City.....	1907
LEE, PROF. LESLIE ALEXANDER, 3 Bath St., Brunswick, Me.....	1903
LELANDE, H. J., 1320 E. 15th St., Los Angeles, Cal.....	1907
LEVERING, THOMAS HENRY, Grant Road, Washington, D. C.....	1898
LEIBELSPERGER, WALTER H., Fleetwood, Pa.....	1907
LONG, WILLIAM B., 249 Tappan St., Brookline, Mass.....	1907
LOOMIS, JOHN A., Mereta, Texas.....	1887
LORD, REV. WILLIAM R., Rockland, Mass.....	1901
LORING, J. ALDEN, Owego, New York.....	1889
LOWELL, HENRY H., 53 Glenwood Ave., Newton Centre, Mass.....	1907
LOW, ETHELBERT T., 38 E. 64th St., New York City.....	1907
LUM, EDWARD H., Chatham, N. J.....	1904
MACDOUGALL, GEORGE R., 131 W. 73rd St., New York City.....	1890
MACLAY, MARK W., Jr., 13 W. 31st St., New York City.....	1905
MADDOCK, MISS EMELINE, The Belgravia, Philadelphia, Pa.....	1897
MAHER, J. E., Windsor Locks, Conn.....	1902
MAITLAND, ROBERT L., 45 Broadway, New York City.....	1889
MARBLE, RICHARD M., 7 Keiffer St., Brookline, Mass.....	1907
MARCH, PROF. JOHN LEWIS, Union College, Schenectady, N. Y.....	1903
MARLEY, JOHN S., 4123 Oak St., Kansas City, Mo.....	1906
MARRS, MRS. KINGSMILL, Saxonville, Mass.....	1903
MARSDEN, H. W., Witch Creek, Cal.....	1904
MARSH, DANIEL J., Five Cent Savings Bank, Springfield, Mass.....	1894
MARTIN, MISS MARIA ROSS, College Ave., New Brunswick, N. J.....	1902
MARX, EDWARD J. F., 8 Chestnut Terrace, Easton, Pa.....	1907
MAXON, WILLIAM R., U. S. Nat. Mus., Washington, D. C.....	1906
MCATEE, WALDO LEE, Dept. of Agriculture, Washington, D. C.....	1903
MCCLINTOCK, NORMAN, 504 Amberson Ave., Pittsburgh, Pa.....	1900
MCCONNELL, HARRY B., Box 77, Cadiz, O.....	1904

McCook, Philip James, 15 William St., New York City.....	1895
McEwen, Daniel C., 160 Stirling Pl., Brooklyn, N. Y.....	1901
McHATTON, Dr. HENRY, Macon, Ga.....	1898
McILHENNY, EDWARD AVERY, Avery Island, La.....	1894
McKECHNIE, FREDERICK BRIDGHAM, Ponkapog, Mass.....	1900
McLAIN, ROBERT BAIRD, Market and 12th Sts., Wheeling, W. Va....	1893
McMILLAN, MRS. GILBERT, Gorham, N. H.....	1902
McNEIL, Miss EMILY, Cromwell Hall, Cromwell, Conn.....	1905
MEAD, Mrs. E. M., 2465 Broadway, New York City.....	1904
MEEKER, JESSE C. A., Box 163, Danbury, Conn.....	1899
MERRIAM, HENRY F., 94 New England Ave., Summit, N. J.....	1905
MERRILL, HARRY, Bangor, Maine.....	1883
MERSHON, W. B., Saginaw, Mich.....	1905
METZ, CHARLES W., Box 285, Claremont, Cal.....	1907
MILLER, JAMES HENRY, Lowville, N. Y.....	1904
MILLS, HARRY C., Box 218, Unionville, Conn.....	1897
MILLS, Prof. WILLIAM C., Ohio State Univ., Columbus, O.....	1900
MITCHELL, Dr. WALTON I., 321 Barnes Bldg., Wichita, Kans.....	1893
MONTGOMERY, THOMAS H., Jr., Univ. of Texas, Austin, Texas.....	1899
MOORE, CLEMENT, 107 Euclid Ave., Hackensack, N. J.....	1906
MOORE, Miss ELIZ. PUTNAM, Kent, Conn.....	1905
MOORE, ROBERT THOMAS, W. Main St., Haddonfield, N. J.....	1898
MORCOM, G. FREAN, 1815 N. Raymond Ave., Pasadena, Cal.....	1886
MORGAN, ALBERT, Hartford Fire Ins. Co., Hartford, Conn.....	1903
MORGAN, T. A., 316 High St., Morgantown, W. Va.....	1906
MORSE, Miss MARGARET, Clark University, Worcester, Mass.....	1907
MOSHER, FRANKLIN H., 17 Highland Ave., Melrose, Mass.....	1905
MURPHEY, Dr. EUGENE E., 444 Telfair St., Augusta, Ga.....	1903
MURPHY, ROBERT C., Amer. Mus. Nat. Hist., N. Y. City.....	1905
MYERS, Mrs. HARRIET W., 306 Ave. 66, Los Angeles, Cal.....	1906
MYERS, Miss LUCY F., "Brookside," Poughkeepsie, N. Y.....	1898
NASH, CHAUNCEY C., 245 Newbury St., Boston, Mass.....	1906
NASH, C. W., 94 Lee Ave., Toronto, Ont.....	1906
NASH, HERMAN W., Box 264, Pueblo, Colo.....	1892
NASH, NATHANIEL C., Jr., Hastings 36, Cambridge, Mass.....	1907
NELSON, JAMES ALLEN, 210 Mitchell St., Ithaca, N. Y.....	1898
NEWMAN, Rev. STEPHEN M., 619 Colorado Bldg., Washington, D. C.....	1898
NICHOLS, JOHN M., 46 Spruce St., Portland, Me.....	1890
NICHOLS, JOHN TREADWELL, 42 W. 11th St., New York City.....	1901
NOLTE, Rev. FELIX, St. Benedict's College, Atchison, Kan.....	1903
NORRIS, J. PARKER, Jr., 2122 Pine St., Philadelphia, Pa.....	1904
NORRIS, ROY C., 725 N. 10th St., Richmond, Ind.....	1904
NOWELL, JOHN ROWLAND, Box 979, Schenectady, N. Y.....	1897
NOYES, Mrs. HARRY A., Hyde Park, Vt.....	1905
O'CONNOR, HALDEMAN, 25 N. Front St., Harrisburg, Pa.....	1896
OGDEN, Dr. HENRY VINING, 141 Wisconsin St., Milwaukee, Wis....	1897

OLDYS, HENRY, Dept. of Agriculture, Washington, D. C.....	1896
OLIVER, Dr. HENRY KEMBLE, 2 Newbury St., Boston, Mass.....	1900
OWEN, Miss JULIETTE AMELIA, 306 N. 9th St., St. Joseph, Mo.....	1897
PAINE, AUGUSTUS G., JR., 126 E. 39th St., New York City.....	1886
PANGBURN, CLIFFORD H., 731 Elm St., New Haven, Conn.....	1907
PARKER, Hon. HERBERT, S. Lancaster, Mass.....	1904
PATEN, Mrs. JOHN D., 2212 R St., Washington, D. C.....	1900
PEABODY, Rev. P. B., Blue Rapids, Kans.....	1903
PEARSE, THEED, Crozet, Va.....	1907
PEARSON, LEONARD S., 132 Beechtree Lane, Wayne, Pa.....	1907
PEAVEY, ROBERT W., 791 Coney Island Ave., Brooklyn, N. Y.....	1903
PECK, HENRY O., 62 Pomeroy Ave., Pittsfield, Mass.....	1904
PEET, MAX M., Alpha Kappa Kappa House, 1001 Huron St., Ann Arbor, Mich.....	1907
PERRY, Dr. ELTON, 610 Baylor St., Austin, Tex.....	1902
PETERS, JAMES LEE, Walnut Ave., Jamaica Plain, Mass.....	1904
PETERSON, Dr. CYRUS A., 347 Church Ave., Webster Groves Sta., St. Louis, Mo.....	1904
PETTIS, Miss GRACE L., Science Museum, Springfield, Mass.....	1903
PHELPS, Mrs. J. W., Box 36, Northfield, Mass.....	1899
PHILIPP, PHILIP B., 327 Central Park, West, New York City.....	1907
PHILLIPS, ALEXANDER H., Princeton, N. J.....	1891
PHILLIPS, JOHN CHARLES, 299 Berkeley St., Boston, Mass.....	1904
PHILLIPS, SHERMAN E., Canterbury, N. H.....	1904
PIERCE, A. K., Renovo, Pa.....	1891
PIPER, STANLEY E., Biological Survey, Washington, D. C.....	1906
PITCAIRN, WILLIAM G., 3330 Perrysville Ave., Allegheny, Pa.....	1906
POE, Miss MARGARETTA, 1500 Park Ave., Baltimore, Md.....	1899
POLLOCK, ADELAIDE L., Queen Anne School, Seattle, Wash.....	1906
POMEROY, HARRY KIRKLAND, Box 575, Kalamazoo, Mich.....	1894
POOLE, Miss GRACE L., 22 School St., Rockland, Mass.....	1906
PORTER, LOUIS H., Stamford, Conn.....	1893
PRAEGER, WILLIAM E., 421 Douglas Ave., Kalamazoo, Mich.....	1892
PRICE, JOHN HENRY, Crown W Ranch, Knowlton, Mont.....	1906
PURDY, JAMES B., R. F. D. No. 4, Plymouth, Mich.....	1893
RADCLIFFE, Mrs. WALLACE, 1200 K St. N. W., Washington, D. C.....	1905
RALPH, JAMES R., 205 S. 7th St., Minneapolis, Minn.....	1906
RANN, Mrs. MARY L., Manchester, Iowa.....	1893
RAUB, Dr. M. W., 340 W. King St., Lancaster, Pa.....	1890
RAWLE, FRANCIS W., Lock Box 51, Bryn Mawr, Pa.....	1907
RAWSON, CALVIN LUTHER, Box 33, Norwich, Conn.....	1885
READ, ALBERT M., 1140 15th St. N. W., Washington, D. C.....	1895
REAGH, Dr. ARTHUR LINCOLN, 39 Maple St., West Roxbury, Mass...	1896
REDFIELD, ALFRED C., Wayne, Pa.....	1907
REDFIELD, Miss ELISA WHITNEY, 29 Everett St., Cambridge, Mass...	1897
REDINGTON, ALFRED POETT, Box 66, Santa Barbara, Cal.....	1890

REED, CHESTER A., 75 Thomas St., Worcester, Mass.....	1904
REED, Miss EMILY E., 12 Louisburg Sq., Boston, Mass.....	1904
REED, HUGH DANIEL, 804 E. Seneca St., Ithaca, N. Y.....	1900
REED, Mrs. WILLIAM HOWELL, Belmont, Mass.....	1904
REHN, JAMES A. G., Acad. Nat. Sciences, Philadelphia, Pa.....	1901
REMICK, J. A., Jr., 300 Marlboro St., Boston, Mass.....	1905
RHOADS, CHARLES J., Bryn Mawr, Pa.....	1895
RICHARDS, Miss HARRIET E., 36 Longwood Ave., Brookline, Mass...	1900
RICHARDSON, C. H., Jr., 46 N. Wilson Ave., Pasadena, Cal.....	1903
RICHARDSON, JOHN KENDALL, Wellesley Hills, Mass.....	1896
RIDGWAY, JOHN L., Chevy Chase, Md.....	1890
RIKER, CLARENCE B., Maplewood, N. J.....	1885
ROBERTS, JOHN T., Jr., 350 Main St., Buffalo, N. Y.....	1906
ROBERTS, WILLIAM ELY, George School, Bucks Co., Pa.....	1902
ROBINSON, ANTHONY W., 409 Chestnut St., Philadelphia, Pa.....	1903
RODDY, Prof. H. JUSTIN, State Normal School, Millersville, Pa.....	1891
ROE, CHARLES M., 1630 Chestnut St., Philadelphia, Pa.....	1906
ROGERS, CHARLES H., 109 Patton Hall, Princeton, N. J.....	1904
ROOSEVELT, FRANKLIN DELANO, Hyde Park, N. Y.....	1896
ROSS, GEORGE H., 23 West St., Rutland, Vt.....	1904
ROWLEY JOHN, 505 Everett Ave., Palo Alto, Cal.....	1889
SABINE, GEORGE K., 30 Irving St., Brookline, Mass.....	1903
SAGE, HENRY M., Menands Road, Albany, N. Y.....	1885
SALLEY, FITZHUGH, Holly Hill, S. C.....	1907
SAMPSON, WALTER BEHRNARD, care A. Hatt Whse & Lumber Co., Napa, Cal.....	1897
SANDS, AUSTIN LEDYARD, Greenough Place, Newport, R. I.....	1902
SANFORD, GEORGE ALDEN, 215 W. 23rd St., N. Y. City.....	1906
SANFORD, HARRISON, 65 W. 50th St., New York City.....	1905
SANFORD, Dr. LEONARD C., 216 Crown St., New Haven, Conn.....	1902
SANTENS, JOSEPH A., Carnegie Museum, Pittsburgh, Pa.....	1907
SASS, HERBERT RAVENEL, The Charleston Museum, Charleston, S. C.....	1906
SATTERTHWAIT, A. F., Office of State Zoölogist, Harrisburg, Pa.....	1907
SAUNDERS, ARETAS A., 125 Maple St., New Haven, Conn.....	1907
SAVAGE, WALTER GILES, Monteer, Mo.....	1898
SCHANTZ, ORPHEUS M., Morton Park, Ill.....	1907
SCHMUCKER, Dr. S. C., Rosedale Ave., West Chester, Pa.....	1903
SCHUMACHER, BOWEN W., 510 Laurel Ave., Highland Park, Ill.....	1906
SCHWARZ, FRANK, 1520 Lafayette Ave., St. Louis, Mo.....	1904
SCOVILLE, SAMUEL, Jr., 118 S. 41st St., Philadelphia, Pa.....	1907
SEABURY, JOSEPH S., Wellesley Hills, Mass.....	1906
SEISS, COVINGTON FEW, 1338 Spring Garden St., Philadelphia, Pa...	1898
SHARPLES, ROBERT P., West Chester, Pa.....	1907
SHATTUCK, EDWIN HAROLD, Box 48, Granby, Conn.....	1898
SHAW, HOLTON A., 610 4th Ave., Grand Forks, N. Dakota.....	1898
SHEARER, AMON R., Mont Belvieu, Tex.....	1905

SHERMAN, Miss ALTHEA R., National, Iowa.....	1907
SHIRAS, GEORGE, 3d, Stoneleigh Court, Washington, D. C.....	1907
SHOEMAKER, FRANK H., 2960 Dewey Ave., Omaha, Neb.....	1895
SHROSBREE, GEORGE, Public Museum, Milwaukee, Wis.....	1899
SHUMWAY, GEORGE, Galesburg, Ill.....	1906
SILLIMAN, HARPER, 562 5th Ave., New York City.....	1902
SMITH, BYRON L., 2140 Prairie Ave., Chicago, Ill.....	1906
SMITH, Rev. FRANCIS CURTIS, Boonville, N. Y.....	1903
SMITH, G. WASHBOURNE, 97 Nassau St., N. Y. City.....	1906
SMITH, HORACE C., Capitol Bldg., Denver, Colo.....	1888
SMITH, Dr. HUGH M., 1209 M St. N. W., Washington, D. C.....	1886
SMITH, JESSE L., 219 Central Ave., Highland Park, Ill.....	1907
SMITH, LOUIS IRVIN, Jr., 3809 Chestnut St., Philadelphia, Pa.....	1901
SMITH, N. A. C., Wellesley Hills, Mass.....	1907
SMITH, PHILO W., JR., Box 285, Eureka Springs, Ark.....	1903
SMYTH, Prof. ELLISON A., Jr., Polytechnic Inst., Blacksburg, Va....	1892
SNOW, Prof. FRANCIS H., Univ. of Kansas, Lawrence, Kan.....	1903
SNYDER, WILL EDWIN, 109 E. Mackie St., Beaver Dam, Wis.....	1895
SPAULDING, FRED B., Lancaster, N. H.....	1894
SPINNEY, HERBERT L., Seguin Light Station, Popham Beach, Me....	1900
STANTON, Prof. J. Y., 410 Main St., Lewiston, Me.....	1883
STEBBINS, Miss FANNIE A., 480 Union St., Springfield, Mass.....	1903
STEELE, JOHN H., 4010 Spruce St., West Philadelphia, Pa.....	1906
STEVENS, CAROLINE M., 52 Bowdoin St., Portland, Me.....	1906
STILES, EDGAR C., 145 Centre St., West Haven, Conn.....	1907
STONE, CLARENCE F., Branchport, N. Y.....	1903
STRATTON-PORTER, Mrs. GENE, Limberlost Cabin, Geneva, Ind.....	1906
STURTEVANT, EDWARD, St. George's School, Newport, R. I.....	1896
STYER, Mrs. KATHARINE R., Concordville, Pa.....	1903
SURFACE, Prof. HARVEY ADAM, State Zoölogist, Harrisburg, Pa....	1897
SWAIM, LORING T., 190 Brattle St., Cambridge, Mass.....	1905
SWAIN, JOHN MERTON, Farmington, Me.....	1899
SWALES, BRADSHAW HALL, Grosse Isle, Mich.....	1902
SWARTH, HARRY S., 356 Belden Ave., Chicago, Ill.....	1900
SWENK, MYRON H., 351 N. 28th St., Lincoln, Neb.....	1904
SWEZEY, GEORGE, 61 Polk St., Newark, N. J.....	1901
SWIFT, CARLETON B., St. Mark's School, Southborough, Mass.....	1907
TAVERNER, PERCY A., 55 Elmhurst, Highland Park, Mich.....	1902
TAYLOR, ALEXANDER R., 1205 Gervais St., Columbia, S. C.....	1907
TAYLOR, ALEXANDER O'DRISCOLL, 132 Bellevue Ave., Newport, R. I....	1888
TERRILL, LEWIS McI., 352 Elm Ave., Westmount, Quebec.....	1907
TEST, CHARLES DARWIN, Golden, Colo.....	1906
TEST, Dr. FREDERICK CLEVELAND, 4318 Grand Boulevard Chicago, Ill.....	1892
THOMAS, Miss EMILY HINDS, The Aldine Hotel, Chestnut St., Phila- delphia, Pa.....	1901

THOMPSON, Miss CAROLINE BURLING, 195 Weston Road, Wellesley, Mass.....	1900
THOMPSON, Dr. MILLETT T., Clark University, Worcester, Mass.....	1904
THOMPSON, ROY, Cando, N. D.....	1905
TINKER, ALMERIN D., 631 S. 12th St., Ann Arbor, Mich.....	1907
TOPPAN, GEORGE L., 723 11th St. N. W., Washington, D. C.....	1886
TOWNSEND, WILMOT, 272 75th St., Brooklyn, N. Y.....	1894
TREGANZA, A. O., 610 Utah Saving's & Trust Bldg., Salt Lake City, Utah.....	1906
TROTTER, WILLIAM HENRY, 36 N. Front St., Philadelphia, Pa.....	1899
TRUMBULL, J. H., Plainville, Conn.....	1907
TUCKER, Dr. HENRY, 2000 Pine St., Philadelphia, Pa.....	1907
TUDBURY, WARREN C., 509 High St., Easton, Pa.....	1903
TUFTS, Le ROY MELVILLE, "Thrushwood," Farmington, Me.....	1903
TUTTLE, Dr. CARL, Berlin Heights, Ohio.....	1890
TWEEDY, EDGAR, 142 Deer Hill Ave., Danbury, Conn.....	1902
UNDERWOOD, WILLIAM LYMAN, Mass. Inst. Technology, Boston, Mass.....	1900
UPHAM, Mrs. WILLIAM H., Marshfield, Wis.....	1907
VALENTINE, Miss ANNA J., Bellefonte, Pa.....	1905
VAN CORTLANDT, Miss ANNE S., Croton-on-Hudson, N. Y.....	1885
VAN NAME, WILLARD GIBBS, 121 High St., New Haven, Conn.....	1900
VAN NORDEN, WARNER MONTAGNIE, Jay Mansion, Harrison, N. Y.....	1899
VAN SANT, Miss ELIZABETH, 2960 Dewey Ave., Omaha, Neb.....	1896
VANTASSELL, F. L., 116 High St., Passaic, N. J.....	1907
VARICK, Mrs. WILLIAM REMSEN, 1015 Chestnut St., Manchester, N. H.....	1900
VETTER, Dr. CHARLES, 50 Central Park West, New York City.....	1898
VISHER, STEPHEN S., Forestburg, S. Dakota.....	1904
VOLKMAN, JULIUS T., Webster Grove, Mo.....	1906
VON LINGERKE, JUSTUS, 349 Fifth Ave., New York City.....	1907
WADSWORTH, CLARENCE S., Box 883, Middletown, Conn.....	1906
WALES, EDWARD H., Hyde Park, N. Y.....	1896
WALKER, Dr. R. L., 355 Main Ave., Carnegie, Pa.....	1888
WALLACE, Dr. A. H., 204 Bellevue Ave., Upper Montclair, N. J.....	1907
WALLACE, JAMES S., 69 Front St., Toronto, Ontario.....	1907
WALLINGSFORD, LEO, 216 E. Crippen St., Cadillac, Mich.....	1904
WALTER, HERBERT E., Dr., 53 Arlington Ave., Providence, R. I.....	1901
WALTERS, FRANK, South Sandisfield, Mass.....	1902
WARD, HENRY L., 882 Hackett Ave., Milwaukee, Wis.....	1906
WARREN, Dr. B. H., 236 W. Market St., West Chester, Pa.....	1885
WARREN, EDWARD ROYAL, 20 W. Caramillo St., Colorado Springs, Colo.....	1902
WATSON, GALEN, North Scituate, Mass.....	1907
WATSON, Miss SARAH R., West Horter and Wayne Sts., Germantown, Philadelphia, Pa.....	1900
WEBER, J. A., 70 W. 106th St., New York City.....	1907

WEIR, J. ALDEN, 11 E. 12th St., New York City.....	1899
WELLS, FRANK S., 916 Grant Ave., Plainfield, N. J.....	1902
WENTWORTH, IRVING H., 4a Calle de Hidalgo No. 9, Saltillo, Coahuila, Mexico.....	1900
WEST, LEWIS H., Roslyn, N. Y.....	1887
WESTON, FRANCIS M., Jr., care P. G. Porcher, Mt. Pleasant, S. C.....	1907
WETMORE, MRS. EDMUND, 343 Lexington Ave., New York City.....	1902
WEYGANDT, CORNELIUS, Wissahickon Ave. below Westview St., Germantown, Philadelphia, Pa.....	1907
WHARTON, WILLIAM R., Groton, Mass.....	1907
WHEELER, EDMUND JACOB, 177 Pequot Ave., New London, Conn....	1898
WHEELER, JOHN B., East Templeton, Mass.....	1897
WHELOCK, MRS. IRENE G., 1040 Hinman Ave., Evanston, Ill.....	1902
WHITCOMB, MRS. HENRY F., Amherst, Mass.....	1897
WHITE, FRANCIS BEACH, 6 Phillips Place, Cambridge, Mass.....	1891
WHITE, GEORGE R., Dead Letter Office, Ottawa, Ont.....	1903
WHITE, W. A., 130 Water St., New York City.....	1902
WICKERSHAM, CORNELIUS W., Hastings 2, Cambridge, Mass.....	1902
WILBUR, ADDISON P., 60 Gibson St., Canandaigua, N. Y.....	1895
WILCOX, DR. EMMA D., 307 W. 98th St., New York City.....	1905
WILCOX, T. FERDINAND, 115 W. 75th St., New York City.....	1895
WILDE, MARK L. C., 311 N. 5th St., Camden, N. J.....	1893
WILLARD, BERTEL G., Box 107, Millis, Mass.....	1906
WILLIAMS, J. BICKERTON, Biological Museum, Queen's Park, Toronto, Ontario.....	1889
WILLIAMS, RICHARD FERDINAND, Box 521, New York City.....	1902
WILLIAMS, ROBERT S., New York Botanical Gardens, Bronx Park, New York City.....	1888
WILLIAMS, ROBERT W., Jr., Biological Survey, Washington, D. C....	1900
WILLIAMSON, E. B., Bluffton, Ind.....	1900
WILSON, SIDNEY S., German American Bank Bldg., St. Joseph, Mo....	1895
WISLER, J. JAY, 231 Cherry St., Columbia, Pa.....	1903
WISTER, WILLIAM ROTCH, 505 Chestnut St., Philadelphia, Pa.....	1904
WITHERBEE, MRS F. B., 106 Berkeley St., West Newton, Mass.....	1906
WOOD, J. CLAIRE, 179 17th St., Detroit, Mich.....	1902
WOOD, NELSON R., Smithsonian Institution, Washington, D. C....	1895
WOOD, NORMAN A., 1216 S. University Ave., Ann Arbor, Mich.....	1904
WOOD, S. T., 229 Beverley St., Toronto, Ont.....	1904
WOODCOCK, ARTHUR ROY, Corvallis, Oregon.....	1901
WOODRUFF, EDWARD SEYMOUR, Forest, Fish & Game Com., Albany, N. Y.....	1899
WOODRUFF, FRANK M., Acad. Sciences, Chicago, Ill.....	1904
WOODRUFF, LEWIS B., 14 E. 68th St., New York City.....	1886
WOODWORTH, MRS. NELLY HART, 41 Bank St., St. Albans, Vt.....	1894
WORTHEN, CHARLES K., Box 103, Warsaw, Ill.....	1891
WORTHINGTON, WILLIS W., Shelter Island Heights, N. Y.....	1889

WRIGHT, ALBERT H., 804 E. Seneca St., Ithaca, N. Y.	1906
WRIGHT, Miss HARRIET H., 1637 Gratiot Ave., Saginaw, W. S., Mich.	1907
WRIGHT, HORACE WINSLOW, 82 Myrtle St., Boston, Mass.	1902
WRIGHT, HOWARD W., 830 N. Orange Grove Ave., Pasadena, Cal.	1907
WRIGHT, SAMUEL, Conshohocken, Pa.	1895
WYMAN, LUTHER E., 1959 Washington Boulevard, Chicago, Ill.	1907
YOUNG, JOHN A., 233 W. 23d St., New York City.	1907
YOUNG, Mrs. WILLIAM A., 54 Temple St., West Newton, Mass.	1907
ZAPPEY, WALTER R., 19 Norfolk St., Roslindale, Mass.	1905
ZERRAHN, CARL OTTO, 106 Centre St., Milton, Mass.	1904

DECEASED MEMBERS.

FELLOWS.

Date of Death.

BAIRD, SPENCER FULLERTON.	Aug. 19, 1897
BENDIRE, CHARLES E.	Feb. 4, 1897
COUES, ELLIOTT.	Dec. 25, 1899
GOSS, N. S.	March 10, 1889
HOLDER, JOSEPH B.	Feb. 28, 1888
JEFFRIES, JOHN AMORY.	March 26, 1892
McILWRAITH, THOMAS.	Jan. 31, 1903
MERRILL, JAMES C.	Oct. 27, 1902
SENNETT, GEORGE BURRITT.	March 18, 1900
TRUMBULL, GURDON.	Dec. 28, 1903
WHEATON, JOHN M.	Jan. 28, 1887

HONORARY FELLOWS.

BLANFORD, WILLIAM T.	June 23, 1905
BURMEISTER, HERMANN.	May 1, 1892
CABANIS, JEAN.	Feb. 20, 1906
GÄTKE, HEINRICH.	Jan. 1, 1897
GUNDLACH, JUAN.	March 14, 1896
GURNEY, JOHN HENRY.	April 20, 1890
HARTLAUB, GUSTAV.	Nov. 20, 1900
HUXLEY, THOMAS H.	June 29, 1895
KRAUS, FERDINAND.	Sept. 15, 1890
LAWRENCE, GEORGE N.	Jan. 17, 1895
MILNE-EDWARDS, ALPHONSE.	April 21, 1900
NEWTON, ALFRED.	June 7, 1907

PARKER, WILLIAM KITCHEN.....	July 3, 1890
PELZELN, AUGUST VON.....	Sept. 2, 1891
SALVIN, OSBERT.....	June 1, 1898
SAUNDERS, HOWARD.....	Oct. 20, 1907
SCHLEGEL, HERMANN.....	Jan. 17, 1884
SEEBOHM, HENRY.....	Nov. 26, 1895
TACZANOWSKI, LADISLAS.....	Jan. 17, 1890

CORRESPONDING FELLOWS.

ALTUM, C. A.....	Jan. 1, 1900
ANDERSON, JOHN.....	Aug. 16, 1900
BALDAMUS, EDUARD.....	Oct. 30, 1893
BLAKISTON, THOMAS W.....	Oct. 15, 1891
BLASIUS, RUDOLPH.....	Sept. 21, 1907
BOGDANOW, MODEST N.....	March 4, 1888
BRYANT, WALTER, E.....	May 21, 1905
BULLER, WALTER LAWRY.....	July 19, 1906
COOPER, JAMES G.....	July 19, 1902
CORDEAUX, JOHN.....	Aug. 1, 1899
DAVID, ARMAND.....	Nov. 10, 1900
FATIO, VICTOR.....	March 19, 1906
HAAST, JULIUS VON.....	Aug. 15, 1887
HARGITT, EDWARD.....	March 19, 1895
HOLUB, EMIL.....	Feb. 21, 1902
HOMEYER, E. F. VON.....	May 31, 1889
LAYARD, EDGAR LEOPOLD.....	Jan. 1, 1900
LEVERKÜHN, PAUL.....	Dec. 5, 1905
LYTTLETON, THOMAS, LORD LILFORD.....	June 17, 1896
MARSCHALL, A. F.....	Oct. 11, 1887
MALMGREN, ANDERS JOHAN.....	April 12, 1897
MIDDENDORFF, ALEXANDER THEODORE VON.....	Jan. 28, 1894
MOSJISOVICS, F. G. HERMANN AUGUST.....	Aug. 27, 1897
OUSTALET, EMILE.....	Oct. 23, 1905
PHILIPPI, R. A.....	Aug. — 1904
PREJEVALSKI, N. M.....	Oct. 20, 1887
PRETISS, D. WEBSTER.....	Nov. 19, 1899
PRYER, HARRY JAMES STOVIN.....	Feb. 17, 1888
RADDE, GUSTAV FERDINAND.....	— 1903
SCHRENCK, LEOPOLD VON.....	Jan. 20, 1894
SÉLEYS-LONGSCHAMPS, EDMOND DE.....	Dec. 11, 1900
SEVERTZOW, N.....	Feb. 8, 1885
STEVENSON, HENRY.....	Aug. 18, 1888
TRISTRAM, H. B.....	March 8, 1906

WHARTON, HENRY T.....	Sept. —, 1895
WOODHOUSE, SAMUEL W.....	Oct. 23, 1904

MEMBERS.

FANNIN, JOHN.....	June 20, 1904
JUDD, SYLVESTER D.....	Oct. 22, 1905
RALPH, WILLIAM LEGRANGE.....	July 8, 1907

ASSOCIATES.

ADAMS, CHARLES F.....	May 20, 1893
ALLEN, CHARLES SLOVER.....	Oct. 15, 1893
ANTES, FRANK T.....	Feb. 6, 1907
ATKINS, H. A.....	May 19, 1885
AVERY, WILLIAM CUSHMAN.....	March 11, 1894
BAILEY, CHARLES E.....	—, 1905
BARLOW, CHESTER.....	Nov. 6, 1902
BAUR, GEORGE.....	June 25, 1898
BECKHAM, CHARLES WICKLIFFE.....	June 8, 1888
BILL, CHARLES.....	April —, 1897
BIRTWELL, FRANCIS JOSEPH.....	June 29, 1901
BOARDMAN, GEORGE A.....	Jan. 11, 1901
BOLLES, FRANK.....	Jan. 10, 1894
BRACKETT, FOSTER H.....	Jan. 5, 1900
BREESE, WILLIAM L.....	Dec. 7, 1889
BRENINGER, GEORGE FRANK.....	Dec. 3, 1905
BRENNAN, CHARLES F.....	Mar. 21, 1907
BROKAW, L. W.....	Sept. 3, 1897
BROWN, JOHN CLIFFORD.....	Jan. 16, 1901
BROWNE, FRANCIS CHARLES.....	Jan. 9, 1900
BURNETT, LEONARD E.....	March 16, 1904
CAIRNS, JOHN S.....	June 10, 1895
CALL, AUBREY BRENDON.....	Nov. 20, 1901
CAMPBELL, ROBERT ARGYLL.....	April —, 1897
CANFIELD, J. B.....	Feb. 18, 1904
CARLETON, CYRUS.....	Nov. 15, 1907
CARTER, EDWIN.....	— 1900
CARTER, ISABEL PADDOCK.....	Sept. 15, 1907
CLARK, JOHN N.....	Jan. 13, 1903
COLBURN, W. W.....	Oct. 17, 1899
COLLETT, ALONSO M.....	Aug. 22, 1902
CORNING, ERASTUS, Jr.....	April 9, 1893

COE, W. W.	April 26, 1885
DAFFIN, WM. H.	April 21, 1902
DAKIN, JOHN A.	Feb. 21, 1900
DAVIS, WALTER R.	April 8, 1907
DEXTER, NEWTON.	July 27, 1901
ELLIOTT, S. LOWELL.	Feb. 11, 1889
FAIRBANKS, FRANKLIN.	April 24, 1895
FOWLER, J. L.	July 11, 1899
FULLER, CHARLES ANTHONY.	Mar. 16, 1906
GESNER, A. H.	April 30, 1895
GOSS, BENJAMIN F.	July 6, 1893
HATCH, JESSE MAURICE.	May 1, 1898
HOADLEY, FREDERIC H.	Feb. 26, 1895
HOLMES, LARUE KLINGLE.	May 10, 1906
HOOPES, JOSIAH.	Jan. 16, 1904
HOWLAND, JOHN SNOWDON.	Sept. 19, 1885
INGERSOLL, JOSEPH CARLETON.	Oct. 2, 1898
JENKS, JOHN W. P.	Sept. 27, 1894
JESURUN, MORTIMER.	March —, 1905
JOUY, PIERRE LOUIS.	March 22, 1894
KNIGHT, WILBUR CLINTON.	July 8, 1903
KNOX, JOHN C.	July 9, 1904
KNOX, JOHN COWING.	June 1, 1904
KOCH, AUGUST.	Feb. 15, 1907
KUMLIEN, LUDWIG.	Dec. 4, 1902
KUMLIEN, THURE.	Aug. 5, 1888
LAWRENCE, ROBERT HOE.	April 27, 1897
LINDEN, CHARLES.	Feb. 3, 1888
LLOYD, ANDREW JAMES.	June 14, 1906
MABBETT, GIDEON.	Aug. 15, 1900
MAITLAND, ALEXANDER.	Oct. 25, 1907
MARBLE, CHARLES C.	Sept. 25, 1900
MARCY, OLIVER.	March 19, 1899
MARIS, WILLARD LORRAINE.	Dec. 11, 1895
McKINLAY, JAMES.	Nov. 1, 1899
MEAD, GEORGE S.	June 19, 1901
MINOT, HENRY DAVIS.	Nov. 13, 1890
MORRELL, CLARENCE HENRY.	July 15, 1902
NICHOLS, HOWARD GARDNER.	June 23, 1896
NIMS, LEE.	March 12, 1903
NORTHROP, JOHN I.	June 26, 1891
PARK, AUSTIN F.	Sept. 22, 1893
PAULMIER, FREDERICK CLARK.	March 3, 1906
POMROY, GRACE V.	May 14, 1906
RAGSDALE, GEORGE H.	March 25, 1895
READY, GEORGE H.	March 20, 1903

RICHARDSON, JENNESS.....	June 24, 1893
ROBINS, MRS. EDWARD.....	July 2, 1906
SAND, ISABELLA LOW.....	April 20, 1906
SELOUS, PERCY SHERBORN.....	April 7, 1900
SLATER, JAMES H.....	Feb. —, 1895
SLEVIN, THOMAS EDWARDS.....	Dec. 23, 1902
SMALL, EDGAR A.....	April 24, 1884
SMITH, CLARENCE ALBERT.....	May 6, 1896
SOUTHWICK, JAMES M.....	June 3, 1904
STOWE, W. H.....	March—, 1895
SWEIGER, MRS. J. L.....	March 23, 1907
THORNE, PLATTE M.....	March 16, 1897
THURBER, E. C.....	Sept. 6, 1896
VENNOR, HENRY G.....	June 8, 1884
WATERS, EDWARD STANLEY.....	Dec. 26, 1902
WILLARD, SAMUEL WELLS.....	May 24, 1887
WOOD, WILLIAM.....	Aug. 9, 1885
YOUNG, CURTIS C.....	July 30, 1902

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Series,
Vol. XXXIII

CONTINUATION OF THE
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New
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VOL. XXV.

JANUARY, 1908.

No. 1.

A LONG-DRAWN-OUT MIGRATION: ITS CAUSES AND CONSEQUENCES.

BY REV. G. EIFRIG.

THE migration of birds in the spring of 1907 at Ottawa, Ontario, and vicinity, was a remarkable one from several points of view. And in the hope of being able to help to shed a little light on this fascinating and at the same time mysterious natural phenomenon of bird migration, and to stimulate others to better efforts in this direction, this present article is written.

It was a long-drawn-out migration. The first migrant here, *Otocoris alpestris praticola*, came February 10, in small numbers to the Dominion rifle range near here, where 1800 sheep had been pastured in the open all winter. The last transient migrant observed by the writer was a Black-poll Warbler, June 12. Usually the former comes here, or rather is seen, about February 20, and the latter leaves the first two or three days in June. Anyone will admit that from February 10 to June 12 is quite a long migration period for almost anywhere in the northern hemisphere. But it is not so much the greater length of time, but rather the anomalies occurring *within* the time specified above, that made the last migration here seem a long-drawn-out one. After the arrival of the first two comers from the south, the Prairie Horned Lark and the Crow, the latter arriving about the last week of February or the first of March, there is usually a lull in the migration until March 20-24, when the second batch of migrants puts in an appearance in the shape of the Song Sparrows, Robins, Bluebirds, Red-winged Blackbirds, Bronzed Grackles, Juncos, Purple Finches and Cedar-birds. There seems to be a keen rivalry between some of these

hardy pioneers into the wintry conditions then still prevailing here, for some years the one, other years the other will be first. This year, however, some of these birds came very considerably earlier than this. The cheerful Song Sparrow came March 13, as compared with April 2 of the preceding year, and March 18 of 1905; the Robin respectively, March 16, March 31, March 19; the Bluebird, March 21, April 3, March 24; the Bronzed Grackle, March 23, April 2, March 27; the Red-winged Blackbird, March 23, April 2, March 24. At the same time there was nothing discernible here and in this whole part of Canada, that could be supposed to have induced any birds to come earlier. In February we had had severe winter weather, more so than is usual in that month, and March did not show much letting-up of this. The explanation the writer arrived at, is the following: For several days before the arrival of the Song Sparrow and the others given above, there had been a spell of phenomenally warm weather to the south of us, in the latitude of New York, Washington, Chicago, St. Louis, etc. For many years no such warm weather had been recorded at New York and Washington. This must have had the effect of attracting more hosts of migrants into this latitude, than would have been the case under normal conditions. This in turn must have uncomfortably crowded the bird population already there and made the food supply, not too abundant at that time of the year, rather scarce. These two conditions, or either one alone, would, to my mind, have the effect of urging the hardiest of the birds there, those that would have turned northward first at any rate, even if normally some days later, to do so several days earlier than they would otherwise have done, and thus we had the strange spectacle of seeing and hearing Song Sparrows, Robins, etc., when there were real winter conditions here, much snow, ice, and cold. But right here several exceptions must be noted. The Purple Finch and the Cedar-bird, usually among the first of this batch of migrants, came this year not only not earlier, but very much later than usually. The former came only April 27 and then not nearly in its usual abundance, and the latter even not before June 7, but then as abundant as ever.

Then arrived the usual next-comers, the Tree Swallow, Meadow-lark, Flicker, several of the ducks, the Killdeer, the Phoebe, Marsh

Hawk; in April the Kingfisher, the Savanna and White-throated Sparrows, the Hermit Thrush, etc. But these came in lesser numbers, at greater intervals, less noticeably, than in other years. Then came a standstill, a lull in the migration, and that was prolonged, painfully and ominously prolonged, far into May. The usual April weather gave way to colder weather again, and instead of this being vanquished by May, it only became more pronounced. On May 4 there was an uproarious snowstorm, leaving six inches of snow, some of which remained till the 7th. And the cold weather stayed with us throughout May; now and then there were light snow flurries, as on the 28th, which appeared like a typical raw, blustering April day. Nor were we, in this part of Canada, the only sufferers from these untoward weather conditions; they extended over half of northeastern America. In Washington it was the coldest May for 36 years, and during a trip the writer had occasion to make in the middle of May, he found the same conditions as here, at Detroit, Ft. Wayne, Ind., and nearly as bad at St. Louis, where the unusual spectacle could be had of seeing people in furs and overcoats in the middle of May. As a consequence vegetable life remained at a standstill practically for four to five weeks. The leaf buds on the trees did not open, the trees were bare here throughout May, or very nearly so.

The effect of all this on the migration of birds was simply disastrous. It not only delayed most species considerably, but it scattered their bands, it decreased their numbers and caused a deplorable mortality among certain species.—First, as to the delayment in the coming of many species. From the appended comparative list can be seen, that after April 28 till May 9, there was only one new species recorded, the Whippoorwill, whereas in a chronologically arranged list of the foregoing year there are 23 species recorded within the same time! Then compare the time of arrival of the following birds this year, with that of last. Chimney Swift, 1907, May 10; 1906, April 30. House Wren, May 9, May 2. Spotted Sandpiper, May 19, May 2. Black and White Warbler, May 10, May 4. Yellow Warbler, May 13, May 4. Bobolink, May 18, May 5. Black-throated Green Warbler, May 16, May 7. Parula Warbler, May 15, May 7. Least Flycatcher, May 15, May 11. Hummingbird, May 30, May 15. Wood Pewee, May 31, May 17.

Black-poll Warbler, May 31, May 21. This shows a delayment of from four to seventeen days, or an average of $10\frac{1}{2}$ days for the twelve species. Again, whereas the annual great migratory waves of birds, especially warblers, thrushes and flycatchers, are seen in the gardens along our city limits about May 20–23, this year they were only seen on May 29. But there are exceptions to be noted here also. Last year's first record for the Scarlet Tanager, *e. g.*, was May 17, this year's, May 15; Myrtle Warbler, April 28, May 2. The Nighthawk, which must have had a hard time to find its winged prey, as moths, flies and mosquitos, which were few and far between in May, came on its usual date, May 16.

That the bands of migrants were badly scattered and reduced in number by the cold weather, or rather the lack of food resulting therefrom, cannot be doubted. For instance, during the presence of the Black-poll Warbler here, one can hardly ever be outside of the reach of their voice anywhere in the city — Ottawa is famous for its many large shade-trees along the streets — or in the surroundings, whereas this year I heard only three or four. Normally the Bay-breasted Warbler, together with *Dendroica striata*, the last migrants to arrive here, can be seen by dozens, yes, by hundreds in its favored pine woods, whereas this year they were nearly absent, except for a few hours in a few favored but restricted localities. Similar statements could be made concerning the Cape May Warbler, the Warbling Vireo, the Barn Swallow, etc.; even the Tree Sparrow, Brown Creeper, and Rusty Grackle were hardly in evidence, and the Chimney Swift does not seem to have attained its usual superabundance. Certainly, people that happened to encounter one of the few late larger bird waves, or who noticed the warblers better on account of the missing foliage on the trees in May, will say, I never saw so many birds as this year, or so many warblers, but I am convinced the numbers of many species were less this summer than other years. Perhaps some of the comers, finding conditions so uncongenial here, retraced their way to the south again for some distance. That this was done by the Tree Swallow, at least, I have no doubt, a large flock of which I saw over the Rideau River on March 30, after which none were to be seen again for about two weeks. But here, too, there are exceptions to be recorded. The Ruby-crowned Kinglet seemed to be just as

abundant and jolly as ever, even more so; the Olive-backed Thrush was much commoner than usual; the Spotted Sandpiper I never saw in such abundance anywhere as here in June; and on May 19 the *Dendroica caerulescens*, usually not very numerous even in migration, was so abundant at Dow's Swamp, that its numbers equalled those of all other birds combined.

That the untowardliness of the weather and food conditions not only delayed many species in coming, but made them postpone their departure also, in the case of transient migrants, need not be surprising. Thus, as late as June 7, Tennessee Warblers, Pine Siskins and Olive-backed Thrushes could be heard singing lustily in Major's Hill Park in the center of Ottawa. Of these the Siskins, and Olive-backed Thrushes *probably* breed here in a few scattered instances, but the bulk of them usually retire northward before that time. On the other hand, the Rusty Grackles, Tree Sparrows, and to some extent the White-crowned Sparrows, having arrived later than commonly, did not stay so long as they would normally, but hurried on northward.

But the worst feature in this migration was the deplorable mortality brought about by the un-May-like weather of May. This was probably not so much due to the cold directly, as to the lack of food caused thereby. Vegetation remained at a standstill from end of April to nearly the end of May. The flower and leaf buds did not unfold. As a consequence the small insects, plant lice, etc., that otherwise are found there, were absent. Therefore the insect eaters, especially those living on small insects and lepidoptera, chief among which are the swallows and warblers, had to suffer most. It was a pitiable sight, and a very common one, to see the little warblers with ruffled feathers and half-extended wings, weakened by hunger, searching in the most unlikely places for a little food. On May 28, with snowflakes flying, I saw a Canadian Warbler (*Wilsonia canadensis*) and a Blackburnian Warbler searching for food among rubbish and tin-cans, not able to fly away. Many people, farmers, a lumberman having just returned from Lake Kippewa in the Algoma District, and others, in this and the neighboring counties, told the writer about the "tameness" of the pretty little "black and yellow" birds, that they had "never seen before," allowing one to almost or quite catch them in the hands,

right about the houses, etc. And many were found dead. Two Tree Swallows, one Brown Creeper, one Canadian, and several Blackburnian Warblers were brought to the writer, having been found dead. The last seem to have been the principal sufferers. Three of them were sent to me by a friend from Renfrew County, who had found them dead. Then a strange performance on the part of a Robin was noticed. A Myrtle Warbler was in its last agonies, on a bridge through a farmer's swamp land, when a Robin came and tried to carry it off. Why?

At High Falls, Labelle County, Quebec, 50 miles northeast of Ottawa, the same story could be heard. Many warblers were found dead along the Lièvre River, also at other places. On being questioned, quite a number of the children of a school there, reported having found from one to five dead birds, without having looked for them. Several were brought to the museum at Ottawa, etc. Now, it is safe to assume that for each dead bird found, a hundred or a thousand were not found, so the destruction of bird life, especially of warblers, must have been appalling.

Some curious changes in the habits of several species were also brought about by the unfavorable food and weather conditions. If a person had begun to study warblers in this vicinity this spring, he would have come to the conclusion that warblers were terrestrial or even water-loving birds. And he would have had the facts all in his favor, for a while at least. On May 20, during a walk of about a mile, I saw about 15 Yellow Warblers, all on or near the ground on old weed stalks, some never quitting the edge of pools of water. Later I noticed this many times of the *Mniotilta varia*, *D. Blackburnia* and *D. maculosa* and *Wilsonia canadensis*. Of the Cape May Warbler, a species rather common here about May 23, but found in spruce only in a few spots, I saw only one last May, and that in a dirty dog-pound! The Myrtle Warbler would certainly have been classed as a swamp bird pure and simple, for it could always be seen over open water in swamps, etc., perching on bushes or old cattails and darting after the few passing gnats and moths in true flycatcher style. The above-mentioned tameness, in most cases really weakness, will probably not be noticed again soon. On May 4, after that snowstorm, several Hermit Thrushes hopped on to the veranda of a house and up to within three feet of two persons standing inside the window, in plain view of the birds.

That the nesting of the birds, whose coming had been so delayed, was also somewhat postponed, is almost self-evident. In fact this was not only caused by lateness of arrival, but also by the lack of cover in trees and swamps. Thus the Robins and Redwings, having been here even earlier than usual, in many cases commenced nest building much later, waiting no doubt for the leaves to come out and the cattails to grow to screen their nests from view. Perhaps for the same reason more Robins put up their establishments on houses, under verandas, over doors and windows and like situations, than I have ever seen before.

The following list will serve to further illustrate some of the points made above. It is not by any means a complete list of all species to be recorded here. Birds like Redpolls, Crossbills, many ducks, hawks, etc., are omitted for apparent reasons. Some species, like the Brown Thrasher, the Olive-sided Flycatcher, the Black-billed Cuckoo, Osprey, etc., were not seen by me till June or July, after being installed in their breeding places for some time.

Dates of Arrival.

	1907	1906	1905
Prairie Horned Lark	Feb. 10	Feb. 20	Feb. 28
Crow	Mar. 2	Mar. 9	" 18
Song Sparrow	" 13	Apr. 2	Mar. 18
Robin	" 16	Mar. 31	" 19
Blue Heron	" 17	Apr. 5	—
Bluebird	" 21	" 3	Mar. 24
Cowbird	" 21	" 8	" 29
Bronzed Grackle	" 23	" 2	" 27
Red-winged Blackbird	" 23	" 2	" 24
Tree Sparrow	" 23	" 9	" 24
Meadowlark	" 23	" 5	Apr. 3
Migrant Shrike	" 25	" 16	Mar. 30
Marsh Hawk	" 25	" 12	Apr. 1
Junco	" 25	" 6	Mar. 23
Golden-eye	" 26	Mar. 29	—
Flicker	" 26	Apr. 16	Apr. 10
Winter Wren	" 26	" 18	" 17
Golden-crowned Kinglet	" 26	" 14	" 8
Killdeer	" 26	" 16	Mar. 28
Tree Swallow	" 26	" 8	Apr. 3
Phoebe	" 26	" 9	" 8

Dates of Arrival.

	1907	1906	1905
Herring Gull	Mar. 30	Apr. 3	Apr. 10
Sparrow Hawk	" 30	" 7	" 18
Savanna Sparrow	" 31	" 15	" 11
Vesper Sparrow	Apr. 1	" 15	" 12
Brown Creeper	" 2	" 15	Mar. 30
Chipping Sparrow	" 3	" 15	Apr. 12
Kingfisher	" 13	" 16	" 8
Hooded Merganser	" 13	" 7	" 17
Wilson's Snipe	" 18	" 20	—
Hermit Thrush	" 18	" 14	Apr. 10
Barn Swallow	" 18	" 21	" 25
Yellow-bellied Sapsucker	" 27	" 15	" 10
Downy Woodpecker	" 27	" 8	" 11
Purple Finch	" 27	Mar. 29	Mar. 1
White-throated Sparrow	" 28	Apr. 15	Apr. 23
Ruby-crowned Kinglet	" 28	May 1	" 27
Myrtle Warbler	" 28	" 2	May 1
Purple Martin	" 26	Apr. 22	Apr. 23
Whippoorwill	May 5	May 1	—
House Wren	" 9	" 2	Apr. 28
Chimney Swift	" 10	Apr. 30	May 2
Black and White Warbler	" 10	May 4	Apr. 28
White-crowned Sparrow	" 13	" 16	May 16
Yellow Warbler	" 13	" 4	" 1
Blackburnian Warbler	" 13	" 10	" 1
Rose-breasted Grosbeak	" 13	" 13	" 11
Bank Swallow	" 14	" 13	" 18
Redstart	" 14	" 15	" 5
Water-thrush	" 14	" 11	" 8
Kingbird	" 14	" 7	" 5
Baltimore Oriole	" 14	" 13	" 6
Ovenbird	" 14	" 13	" 6
Canadian Warbler	" 15	" 19	" 12
Parula Warbler	" 15	" 7	" 10
Black-throated Blue Warbler	" 15	" 7	" 10
Goldfinch	" 15	Apr. 17	Mar. 13
Least Flycatcher	" 15	May 11	May 5
Nashville Warbler	" 15	" 7	" 7
Magnolia Warbler	" 15	" 16	" 10
Wilson's Thrush	" 15	" 6	" 6
Scarlet Tanager	" 15	" 17	" 14
Wilson's Warbler	" 15	" 21	" 19
Nighthawk	" 16	" 16	" 14

Dates of Arrival.

	1907	1906	1905
Warbling Vireo	May 16	May 6	May 10
Red-eyed Vireo	" 16	" 15	" 6
Bay-breasted Warbler	" 16	" 16	" 19
Black-throated Green Warbler	" 16	" 7	" 1
Tennessee Warbler	" 16	" 17	" 24
Cape May Warbler	" 16	" 12	" 22
Northern Yellowthroat	" 16	" 11	" 4
Olive-backed Thrush	" 16	" 13	" 16
Catbird	" 17	" 15	" 6
Chestnut-sided Warbler	" 17	" 13	" 7
Bobolink	" 18	" 5	" 2
Crested Flycatcher	" 19	" 11	" 12
Blue-headed Vireo	" 19	" 15	" 7
Cliff Swallow	" 19	" 9	" 17
Rusty Grackle	" 19	" 7	Apr. 10
Spotted Sandpiper	" 19	" 2	May 4
Sora	" 19	" 8	—
Solitary Sandpiper	" 20	" 18	—
Swamp Sparrow	" 20	Apr. 18	May 8
Bittern	" 20	" 16	—
Gray-cheeked Thrush	" 23	—	May 14
Alder Flycatcher	" 24	May 19	" 24
White-breasted Nuthatch	" 24	Apr. 4	Feb. 28
Mourning Warbler	" 29	May 19	May 12
Red-headed Woodpecker	" 29	" 26	
Blackpoll Warbler	" 31	" 21	May 17
Wood Pewee	" 31	" 17	" 4
Hummingbird	" 30	" 15	" 11

Ottawa, Ontario, Aug. 23, 1907.

NOTES ON THE SPRING MIGRATION (1907) AT
ANN ARBOR, MICHIGAN.¹

BY NORMAN A. WOOD.

INTRODUCTION.

FROM the last week in April to June 6, 1907, the writer made almost daily observations on the bird life in the vicinity of Ann Arbor, Michigan. Beginning at 4 A. M., from four to six hours per day were spent in the field, listing all of the species seen and collecting the rarer and doubtful specimens. Unusually low temperatures in May attended by continued snow and ice to the north, apparently prevented large numbers of the migrant warblers from leaving this vicinity until the last of May and the first of June, giving us the latest records on our migration lists, and furnishing rare opportunities for observation and study of these and other species.

GENERAL CONDITIONS.

January, 1907. This was not a cold month for this region, as the average temperature was only 20.6° F. But few winter visitors were seen; a few Pine and Evening Grosbeaks, one small flock of White-winged Crossbills, a few Pine Siskins, and several flocks of Redpolls, make up the list of recorded species. Several small colonies of Red-headed Woodpeckers wintered in heavy oak woods, and numbers of Song Sparrows along the streams. The former is a rare winter resident in this vicinity although the latter is common.

February. As a whole this was also a relatively mild month, the average temperature being 18.1°, and the Robin, Bluebird and Meadow Lark came (before Feb. 26) earlier than the average arrival, which is the first week of March.

March. The first part of March was colder and for the first ten days the temperature was below the normal (29.1°). No migrants were seen until the 10th. From the 10th to the 21st,

¹ From the University Museum, University of Michigan.

the temperature was above the normal most of the time, and from the latter date to March 31, the departure from the normal was considerable, the increase over the usual temperature ranging from ten to twenty degrees per day. The maximum (71°) was on March 27. The temperature for the month was 34.6° . The continued warm weather of the last week may have caused the large number of migrants; 27 species being recorded after the 21st.

April. This was an unusually cold month, the average temperature being 35.1° , nearly the same as that of March, making this the coldest April in Michigan since 1874. Only three species of migrants were seen before April 18, when the first warbler (Myrtle) was seen. This was only three days later than our earliest record for this species. From April 18 to 30, 31 species of birds were noted and, notwithstanding the cold weather, several of the early warblers arrived; the Yellow and the Pine Warblers on April 26.

May. This month was also very cold with some snow and ice, with many hard frosts as late as the 28th. The average temperature was 44.5° , or 7.6° below the normal. These conditions did not seem to affect the bird migration, as the species continued to come with very little variation from the usual dates of arrival. This was especially true of the earlier warblers, and the most of them arrived at about the average date for the species in spite of the fact that all vegetation was at least two weeks later than common. But notwithstanding the fact that most of the species arrived here at the usual date, they continued to linger long after that time. Nor was it the spring migrants alone that lingered, but several of the winter visitants also, as the Pine Siskin was seen on May 17, the White-throated Sparrow on May 21 and the Junco on May 22. Associated with these species I found the Cape May, Palm, Blackpoll, Bay-breasted, Chestnut-sided, Tennessee, Myrtle, Magnolia, Black-throated Blue, and Black-throated Green Warblers. On the morning of May 21 I found ice one eighth of an inch thick that had formed in a boat on the beach at Portage Lake, Washenaw County, Mich., but all the birds just mentioned were seen along the bluff near this lake, and again on June 2, with the exception of the Junco, White-throated Sparrow, Palm, and Cape May Warblers, which were not seen after May 22. The morning of May 28 was cold with a hard white frost and a temperature of 34° ,

but I found six Wilson's, three Mourning, and two Connecticut Warblers. These three species are rare here as a rule, but this year they occurred in unusual numbers.

I give below a list of migrant warblers with the dates of arrival, and departure, and it will be seen that most of the latter dates are later than any previous records for this region. In the appended list I have given the earliest dates on which most of our spring migrants were observed here this year.

List of migrant Warblers giving the earliest and latest Spring Records in 1907.

	Earliest Record.	Latest Record.
1. Myrtle Warbler.....	April 18	June 3.
2. Yellow Warbler.....	April 26	
3. Pine Warbler.....	April 26	May 2.
4. Black-and-White Warbler.....	April 27	May 28
5. Palm Warbler.....	April 29	May 22.
6. Black-throated Green Warbler.....	April 29	June 6.
7. Nashville Warbler.....	May 3	June 3.
8. Blackburnian Warbler.....	May 9	June 6.
9. Chestnut-sided Warbler.....	May 9	June 6.
10. Black-throated Blue Warbler.....	May 9	May 30.
11. Magnolia Warbler.....	May 9	June 6.
12. Prairie Warbler.....	May 12	May 15.
13. Tennessee Warbler.....	May 12	June 6.
14. Parula Warbler.....	May 12	May 16.
15. Canadian Warbler.....	May 13	June 2.
16. Kirtland Warbler.....	May 13	May 16.
17. Hooded Warbler.....	May 13	May 13.
18. Prothonotary Warbler.....	May 13	May 21.
19. Bay-breasted Warbler.....	May 13	June 6.
20. Black-poll Warbler.....	May 16	June 6.
21. Connecticut Warbler.....	May 18	June 6.
22. Cape May Warbler.....	May 21	May 21.
23. Mourning Warbler.....	May 28	May 31.
24. Wilson's Warbler.....	May 28	June 6.
25. Golden-winged Warbler.....	May 11	
26. Cerulean Warbler.....	May 15.	

CONCLUSION.

By comparing these dates of arrival with my table of migration for 25 years (Eighth Report, Michigan Academy of Science, 1906, pp. 151-157), I find they correspond very closely with the average dates of arrival as given there, showing that this year the later migrants arrived in this locality at about the same date, and further that very few are later than usual, notwithstanding the cold and the fact that all vegetation was at least two weeks later than usual. This favors the belief that these birds are not governed exactly in their northward migration by weather or food conditions, but that while they may start out on their migration only under favorable conditions, they often migrate into regions of unfavorable conditions before being checked. Thus the species that reached this locality were in fine condition, but as the conditions here as well as to the northward were unfavorable, many individuals remained here an unusually long time. This was strikingly illustrated by the fact that many of those that migrate the farthest north were the last to leave this locality. I found no evidence of mortality here, due to weather or food conditions, but Miss Harriet Wright of Saginaw, Mich., wrote me that on the morning of May 27 (following a severe night with snow and ice), she picked up numbers of dead warblers of the following species: Tennessee, Canadian, Chestnut-sided, Magnolia, Blackburnian, and Black-throated Green Warblers.

Furthermore, as proof that birds of many species do migrate far ahead of safe weather and food conditions, Prof. W. H. Munson of the State Normal School, Winona, Minnesota, has given me the following statement: "The weather was cold in May, and the vegetation very backward, insect life was scarce and the migrants (which came a little later than usual) had hard work to find sufficient food. This fact combined with the severe cold and storms caused the death of hundreds of birds of many different species. The greatest mortality seemed to be among the Flycatchers of which the Least Flycatcher seemed to suffer the most. A boy brought to me a peck basket nearly full of birds, consisting principally of this species, which he had picked up along the bluff where the birds went for protection from the storms. Large numbers of Black-and-White Warblers were found dead, and the

Tennessee Warblers suffered nearly as great a loss, as did also the Nashville Warblers. A few Chestnut-sided, Bay-breasted, and Black-poll Warblers, were found dead. [The small number found of the last three may be accounted for by these species being late arrivals, thus encountering better conditions.] Four Palm Warblers, 2 Baltimore Orioles, 1 Rough-winged Swallow, 2 Purple Martins (the most of the last species did not arrive until warmer weather), 1 Rose-breasted Grosbeak, 1 Red-eyed Vireo, 6 Oven-birds, a few Prothonotary Warblers and several Yellow-breasted Chats were also brought in dead. The Myrtle Warbler was very abundant, but only a few were found dead, [possibly owing to their great diversity of diet, being able to eat seeds and food not available to most warblers]. The Yellow Warbler also seemed hardy, as none were found dead. The mortality must have been large, as no effort was made to collect these dead birds, and nearly all were picked up by school children. All birds observed were very emaciated and the stomachs and intestines were empty."

List of Spring Migrants, exclusive of Warblers, giving date when first seen.

1. Meadowlark	Feb. 6.	21. Cooper's Hawk	Mar. 22.
2. Bluebird	Feb. 20.	22. House Wren	Mar. 22.
3. Robin	Feb. 25.	23. Purple Martin	Mar. 23.
4. Red-tailed Hawk	Mar. 10.	24. Chipping Sparrow	Mar. 23.
5. Red-shouldered Hawk	Mar. 10.	25. Great Blue Heron	Mar. 23.
6. Rusty Blackbird	Mar. 10.	26. Black Duck	Mar. 23.
7. Red-winged Blackbird	Mar. 13.	27. Tufted Titmouse	Mar. 24.
8. Killdeer	Mar. 13.	28. Field Sparrow	Mar. 24.
9. Bronzed Grackle	Mar. 15.	29. Hermit Thrush	Mar. 24.
10. Cowbird	Mar. 16.	30. Broad-winged Hawk	Mar. 24.
11. Marsh Hawk	Mar. 16.	31. American Bittern	Mar. 25.
12. Woodcock	Mar. 16.	32. Yellow-bellied Sap-	
13. Towhee	Mar. 16.	sucker	Mar. 26.
14. Swamp Sparrow	Mar. 16.	33. Loon	Mar. 28.
15. Prairie Horned Lark	Mar. 16.	34. Ring-billed Gull	Mar. 28.
16. Pewee	Mar. 22.	35. Greater Yellow-legs	Mar. 30.
17. Winter Wren	Mar. 22.	36. Red-head Duck	Mar. 30.
18. Fox Sparrow	Mar. 22.	37. Ruddy Duck	Mar. 30.
19. Vesper Sparrow	Mar. 22.	38. American Coot.	Mar. 30.
20. Golden-crowned King-		39. Tree Swallow	Mar. 30.
let	Mar. 22.	40. Lesser Scaup Duck	Mar. 30.

41. Red-bellied Wood-pecker	Mar. 31.	75. Wilson's Thrush	May 3.
42. Pied-billed Grebe	Mar. 31.	76. Rose-breasted Gros-beak	May 3.
43. American Osprey	April 1.	77. Ovenbird	May 5.
44. Brown Thrasher	April 3.	78. Sora Rail	May 5.
45. Wilson's Snipe	April 5.	79. Least Flycatcher	May 5.
46. Greater Scaup Duck	April 18.	80. Louisiana Water-thrush	May 6.
47. Bufflehead Duck	April 19.		May 6.
48. Hooded Merganser	April 20.	81. Florida Gallinule	May 6.
49. Bank Swallow	April 20.	82. Wood Pewee	May 9.
50. Barn Swallow	April 20.	83. Solitary Vireo	May 9.
51. Sharp-shinned Hawk	April 20.	84. Long-billed Marsh Wren	May 9.
52. Olive-backed Thrush	April 20.		May 9.
53. White-throated Sparrow.	April 23.	85. Warbling Vireo	May 10.
54. Chimney Swift	April 24.	86. Alder Flycatcher	May 10.
55. Blue-gray Gnatcatcher	April 27.	87. Yellow-throated Vireo	May 12.
	April 27.	88. Crested Flycatcher	May 12.
56. Cliff Swallow	April 27.	89. Green Heron	May 12.
57. Bonaparte's Gull	April 27.	90. Common Tern	May 12.
58. Spotted Sandpiper	April 27.	91. Horned Grebe	May 12.
59. Virginia Rail	April 27.	92. Scarlet Tanager	May 13.
60. Rough-winged Swallow	April 27.	93. Red-eyed Vireo	May 13.
61. Bartram's Sandpiper	April 28.	94. Ruby-throated Hummingbird	May 13.
62. Bobolink	April 28.	95. Black-billed Cuckoo	May 13.
63. Wood Duck	April 28.	96. Yellow-billed Cuckoo	May 13.
64. Northern Yellow-throat	April 28.	97. Indigo Bunting	May 14.
	April 28.	98. Whip-poor-will	May 14.
65. Kingbird	April 28.	99. Least Bittern	May 15.
66. Pin-tail Duck	April 28.	100. Orchard Oriole	May 15.
67. Baltimore Oriole	April 28.	101. Pine Siskin	May 17.
68. American Redstart	April 29.	102. Black Tern	May 18.
69. Red-breasted Merganser	April 29.	103. Night Hawk	May 18.
	April 29.	104. Turkey Vulture	May 29.
70. Alice's Thrush	April 29.	105. Yellow-bellied Flycatcher	May 30.
71. Lark Sparrow	May 1.		May 30.
72. Catbird	May 1.	106. Philadelphia Vireo	May 30.
73. Red-breasted Nuthatch	May 1.	107. Olive-sided Flycatcher	June 6.
74. Wood Thrush	May 2.		

NESTING HABITS OF BIRDS AT STAMFORD, CONNECTICUT, AS AFFECTED BY THE COLD SPRING OF 1907.

BY LOUIS H. PORTER.

THE spring of 1907 was abnormally cold and backward. The prevailing temperature during the last week of May and the first week of June was about the same as we usually expect the middle of April. While vegetation was somewhat backward, the effect on the nesting habits of our birds was even more pronounced and interesting.

During the migrating season I saw very few birds, less than a tenth as many migrants as usual, but those that I did see were at about the usual dates, and did not average later than normal. During the nesting season, however, birds seemed more abundant than usual, but their habits were materially altered. I did not obtain sufficient data to justify any broad generalization, but from my observations it seemed that most birds commenced nest building at about the average calendar date, but that as a result of the cold season the more delicate species took very much longer in their nest building; when the nest was finally completed, the egg laying period was also protracted, extending to two or three times its usual period; and finally that after the set was completed, the birds, in some cases at least, did not immediately commence sitting.

If other observers noticed a similar condition, an interesting question is raised as to the extent to which this protraction of the breeding period was due to volition on the bird's part, or to the physical effect of the cold weather upon the genital organs.

My records show the following data in support of these conclusions.

Helminthophila pinus. This bird breeds abundantly at Stamford, and is the most regular in its habits of any bird I know of. My records prior to this year give the earliest breeding date, May 27, and the latest June 10 (young nearly ready to fly) with an average of May 29. All the sets I had taken May 30, or later, had incubation well advanced. Other published records which I consulted agree with this experience. Full sets can usually be found

the last few days of May. This year's record shows a marked departure from the normal as follows:—

May 28, found a nest just finished; June 4, this nest had three eggs; June 8, it had four eggs, in which incubation had just begun.

May 28, found nest just finished. June 4, this nest had two eggs; June 8, it had three fresh eggs.

June 6, found nest with one egg; June 10, four fresh eggs.

June 6, found nest with two eggs. June 10, five fresh eggs.

June 6, found nest just finished. June 10, three fresh eggs, female sitting very close.

June 10, found nest, six eggs, incubation just begun.

June 15, found nest, four eggs, incubation five or six days advanced.

June 15, found nest with one egg.

June 15, found nest with two eggs.

I was unable to get out after June 15, and therefore could not watch these last two nests, or take any later notes. The first full set of eggs, however, was June 8, and the average date for a full set of fresh eggs could apparently be put at June 10 or 12, or about two weeks later than the average.

While the data are not so satisfactory as to deposition of eggs, it appears that in one case, the set was not complete in nine days, only three eggs having been laid, in another four eggs were laid in about eight days, in three others three eggs in four days, the latter all toward the end of the season.

I did not find any nests of this species in process of construction.

Dendroica pensylvanica. I have invariably found these eggs from May 29 to June 1. This year the birds were seen abundantly on May 11, and I took a set of fresh eggs June 10, and another somewhat incubated June 15. Aside from the later nesting averages, the chief interest in this species is connected with building times.

May 23, found one nest completed and another just commenced, the birds being hard at work. Both nests were abandoned, although the birds were seen around for some weeks, and neither nest was apparently disturbed.

May 27, found nest half complete, birds hard at work. May 30, there was no apparent change, and the nest was apparently

deserted. The weather had been exceedingly cold and windy. June 10 this nest had four fresh eggs.

Wilsonia mitrata. Prior to 1907, found nests with young nearly ready to fly, June 7, and June 10, and laying female shot May 30. I had not seen this species in Stamford prior to 1904, when I saw two pairs. They have increased rapidly, and this year I saw twenty-five or thirty birds and, in company with Mr. W. H. Hoyt, found eight nests. Chapman's 'Warblers of North America' gives nesting dates for New York City of May 26 to June 15, and Bishop for New Haven of May 27 to June 24. My dates for 1907 were June 8, one set, June 12, two sets, June 15, three sets, June 22, one set, all but the last being fresh or nearly fresh. These eggs seem to average nearly three weeks later than my previous experience, but are not apparently so exceptional as compared with Messrs. Chapman and Bishop's records. The chief interest in this bird is in the slow progress made.

The first bird was seen May 11; May 18 perhaps the same bird was seen in the same spot, near a nest of the previous year. May 23, the bird was seen building, the nest perhaps one third completed. May 30, nest built very high and deep, but not finished. June 6, nest finished. The birds never used the nest, but were seen around on the 6th. On the 10th they were seen disturbed in another part of the woods, but no nest was found. In September the nest they apparently used was found about a hundred yards away. These birds therefore spent thirteen days in building a nest which they subsequently abandoned, building another which was not commenced until after June 10, or three weeks after the time they first began to build.

On May 28 I found another nest just completed. On June 4 this nest had two eggs. On June 8, it had two warbler eggs and one cowbird's egg. All these eggs were perfectly fresh.

On June 4, I found a nest just commenced, the birds being busy building. June 8, the nest was finished, but the bird not seen. June 15, three warbler eggs, and one cowbird; incubation just commenced and bird sitting very close.

June 8, found a nest just finished. June 15, four fresh eggs, bird sitting very close.

On June 15 a nest with three eggs was found, which from the

location, the construction of the nest, the appearance of the eggs, the appearance and actions of the birds, I believe to be a second set of the nest of June 8. Mr. Hoyt took this set June 22, with four eggs, and incubation four or five days advanced.

With this species the authorities give the average normal time from commencing the nest to the completion of the set of eggs as about a week. This year nesting commenced not much later than usual, but the time until incubation commenced was extended from a normal of one week to from two to three weeks.

Geothlypis trichas brachidactyla. I have previously taken sets of these eggs from May 28 to June 6. Chapman gives New York City dates as May 25 to June 15, and Bishop, New Haven dates as May 28 to June 18.

This year I took a set of fresh eggs June 10, and a set with incubation just begun, June 15.

This second nest was found finished on June 4. On June 12 there were four eggs, but the birds were not seen, although I watched nearly an hour. On June 15, incubation had just commenced. The period of deposit of eggs was in this case clearly prolonged, and the dates seem later than the average.

Icteria virens. This species breeds abundantly, dates in former years running from May 22 to June 15. I found six nests in varying stages, but none of them contained eggs up to June 15.

Seiurus aurocapillus. I have previously taken these eggs from May 23 to June 6. The latest fresh eggs were May 26, and in all sets subsequent to that date incubation was advanced. Chapman gives New York City dates of May 20 to July 5, and Bishop, New Haven, May 30 to July 10. The later dates are clearly second sets. The average for the first sets would therefore appear to be the last week in May. This year I found four sets, all fresh,—one May 30, one June 10, and two June 12. The nest of May 30 was found finished on May 23. On June 12, Mr. Hoyt found a nest building and took a set of fresh eggs June 22. This species apparently averaged two weeks later than usual.

Seiurus motacilla. These birds are hardy, usually arriving the middle of April, and nesting being well under way by May 15. We naturally should not expect the cold season to affect these birds.

The only nest I found was on May 23, containing young birds

just hatched. On June 10, in another woods, I saw a young of the year just able to fly. These dates are if anything somewhat earlier than my usual experience. Apparently these birds nested without regard to the temperature.

Setophaga ruticilla. The three sets found this year were not as much later than the normal as most of the warblers. The dates were June 8, incubation begun; June 16, incubation almost complete; June 22, incubation advanced. The nest of June 8 was half completed on May 21, was finished and birds not seen May 28, and had three eggs about two days incubated on June 8.

Vireo olivaceus. This species breeds abundantly. Normally two or three nests can be found any day from June 1 to June 15. Eggs taken after June 12 have all been incubated. This year only one nest was found, and that was building on June 15. They were from two to three weeks later than usual.

Vireo noveboracensis. These birds were not apparently much later in commencing nesting, but took longer to build.

May 25 found two nests about half finished; May 28 no change in appearance of either nest. June 4, birds hard at work at both nests, which appeared to be completed. June 12, one nest had four eggs, and the other three. In each case the bird was sitting very close, and the eggs were fresh.

June 1, found nest almost complete. June 9, one egg. I was unable to visit this nest again. On the mornings of June 2 and 3, the thermometer was at 45° F.

Empidonax virescens. In the colony I reported in last year's 'Auk,' two nests were taken June 2, and one June 7. This year I frequently saw several birds in the vicinity of the breeding site. June 12, a nest was found commenced; June 16 it was completed; June 22, three eggs with incubation just begun. These birds were therefore from two to three weeks later than the same colony of birds last year.

Pipilo erythrophthalmus. This is another hardy bird. My previous dates run from May 21 to June 5. These birds seemed unaffected by the cold. I found five nests from May 28 to June 6. Two of the nests were six feet high in cedar trees. I have not before found this species nesting off the ground. The question suggests itself whether these birds varied their usual nesting site on account of the cold wet season.

Parus atricapillus. The normal dates for fresh eggs are from May 10 to May 30. This year the only nest found was building on May 25, and had a set of seven nearly fresh eggs on June 4.

The divergence from the normal nesting did not attract my notice until it was too late to take any notes or data concerning the commoner birds, whose nests I saw in numbers, without collecting or accurately noting. At the same time, in the case of some of the rarer nests I found this year I have no other data with which this year's can be compared. The foregoing species are therefore the only ones as to which I have any accurate data available.

The data given seem to show, that the tender and delicate birds averaged about two weeks later than usual in deposit of eggs in 1907, and that they spent much more than the normal time in nest building. The conclusion seems inevitable that both of these phenomena were directly caused by the unseasonably cold weather.

THE BREEDING SEASON OF THE AMERICAN BARN OWL (*STRIX PRATINCOLA*) IN SOUTH CAROLINA.

BY ARTHUR T. WAYNE.

IN Audubon's 'Ornithological Biography,' Vol. II, pp. 404-405, he states the following concerning the breeding of this species:

"Having arrived at Charleston, South Carolina, in October, 1833, as soon as my family and myself were settled in the house of my friend the Reverend John Bachman, I received information that a pair of owls (of the present species) had a nest in the upper story of an abandoned sugar-house in the city, when I immediately proceeded to the place, accompanied by Dr. Samuel Wilson and William Kunhardt, Esq. We ascended cautiously to the place, I having pulled off my boots to prevent noise. When we reached it, I found a sort of large garret filled with sugar-moulds, and lighted by several windows, one of which had two panes broken. I at once discovered the spot where the owls were by the hissing sounds of the young ones, and approached slowly and cautiously

towards them, until within a few feet, when the parent bird seeing me, flew quickly towards the window, touched the frame of the broken panes, and glided silently through the aperture. I could not even afterwards observe the course of its flight. The young were three in number, and covered with down of a rich cream color. They raised themselves on their legs, appeared to swell, and emitted a constant hissing sound, somewhat resembling that of a large snake when angry. They continued thus without altering their position, during the whole of our stay, which lasted about twenty minutes. They were on a scattered parcel of bits of straw, and surrounded by a bank made of their ejected pellets. Very few marks of their excrements were on the floor, and they were beautifully clean. A Cotton Rat, newly caught, and still entire, lay beside them, and must have been brought from a distance of several miles, that animal abounding in the rice-fields, none of which, I believe, are nearer than three or four miles. After making some arrangements with the Negro man who kept the house, we returned home. The eggs from which these young owls had been hatched must have been laid six weeks before this date, or about the 15th of September.

"On the 25th of November they had grown much in size, but none of the feathers had yet made their appearance, excepting the primaries, which were now about an inch long, thick, full of blood, and so tender that the least pressure of the fingers might have burst them. As the young grow more and more, the parents feed and attend to them less frequently than when very small, coming to them in the night only with food. This proves the caution of these birds in avoiding danger, and the faculty which the young possess of supporting abstinence in this middle state of their growth.

"On the 7th of December I visited the Owls in company with my friend John Bachman. We found them much grown; indeed, their primaries were well out; but their back and breast, and all their lower parts, were still thickly covered with down.

"On the 6th of January I again saw them, but one of the young was dead, although in good condition. I was surprised that their food still continued to be composed entirely of small quadrupeds, and principally of the rat mentioned above.

"My last visit to them was on the 18th of January. The two younger ones were now, to all appearance, full grown, but were yet unable to fly. A few tufts of down still remained attached to the feathers in scattered parts of the body. I took them home. One was killed, and the skin preserved.

"Now, these facts are the more interesting, that none of the numerous European authors with whom I am acquainted, have said a single word respecting the time of breeding of this species, but appear to be more intent on producing long lists of synonyms than on presenting the useful materials from which the student of nature can draw inferences. I shall therefore leave to them to say whether our species is, or is not, the same as the one found in the churches and ruins of Europe. Should it prove to be the same species, and if the European bird breeds, as I suspect it does, at so different a period of the year, the American Owl will form a kind of mystery in the operations of nature, as they differ not only from those of the bird in question, but of all other Owls with which I am acquainted."

Although I have been endeavoring to procure the eggs of this species for more than twenty years in order to establish the normal season in which it breeds, information has only recently been obtained. A pair of these Owls has been breeding for many years in an old mill on the plantation of Mr. J. St. Clair White, near the banks of the Cooper River. Mrs. White, the wife of the owner of the plantation, in answering a communication relative to the eggs of this bird, wrote under date of January 3, 1906, as follows: "Knowing quite as much about the Owls as he [Mr. White] does, through the children, who have always been interested in them, I will state that there were young there [the old mill] a month ago." I then concluded that the eggs must be laid during the month of November and requested the sons of Mr. White to keep a close watch on the building. On November 18, 1906, Mrs. White wrote: "I had to wait for Thomas [her son] to go to the barn to find out what the Owls were doing, and as is usual at this season they have a nest of young."

As Audubon does not mention in his 'Birds of America' the account of the breeding of this species witnessed by him in Charleston, and as this work was said by him to be "similar to my large

work" (Ornithological Biography), I naturally inferred that he was not acquainted with the breeding habits of this Owl and hoped to establish a record, when it occurred to me that I had read, when a youth, in the latter work a long account of the breeding of this species and recalled the *month* in which the eggs were laid. A letter was sent to Mrs. White on September 17, 1907, with the request that the mill be searched for eggs. On September 19, her son, Master Thomas Porcher White, succeeded in finding six eggs. Upon the reception of the eggs I observed that they were all laid at irregular intervals of five to twelve days, as one egg contained a very large embryo, another about one half incubated, a third had a well-formed embryo, while the others were in lesser stages of development. The first egg must have been laid not later than September 5, as it undoubtedly had been incubated for at least fourteen days.

Much credit is due young White for his untiring efforts in my behalf in order that the normal season should be definitely established.

That this species should breed in South Carolina in September is indeed remarkable, for according to Davie (*Nests and Eggs of North American Birds*, p. 191), it breeds in southern Florida in March, while in the region of Los Angeles, California (Lat. 34°), the breeding season extends from April until the last of June.

As no mention is made of the breeding of this owl in the States of Florida and California during the autumnal months, the spring must therefore be considered the regular season in which it breeds, unless it annually rears two broods, and if such proves to be the case the birds may be autumnal breeders in those States. The reason this species breeds in September in the low coast region of South Carolina is doubtless due to the fact that the food supply, which consists of small mammals, is more abundant and more easily procured during the autumnal and early winter months than in late winter and spring.

Since the above was written I found an account of the breeding of this owl by Mr. R. W. Williams, Jr., in 'The Auk,' XIX, 1902, p. 198, wherein he states that a set comprising five eggs was found on December 12. These observations were made at Tallahassee, which is in the northwestern part of Florida and near the Georgia line.

Mr. R. D. Hoyt of Seven Oaks, Hillsboro County, Florida, writes me under date of Oct. 19, 1907: "No, I have never taken the Barn Owl here, and September seems a queer time for them to nest in South Carolina. This owl is very plentiful in the Cape Sable region, Florida. Two years ago I saw as many as eight or ten at a time flying over the marshes just at dusk, and it would be interesting to know when they breed in that country, as there is no timber to speak of, and in the daytime the owls roost in the grass, the same as Short-eared [*Asio accipitrinus*]."

I am indebted to my friend Mr. Herbert Ravenel Sass for transcribing Audubon's account in his 'Ornithological Biography.'

SUMMER BIRDS OF SOUTHWESTERN SASKATCHEWAN.¹

BY A. C. BENT.

77. ***Asio wilsonianus*.** AMERICAN LONG-EARED OWL.—Only one pair was found. On June 2, 1905, I climbed to an old Roughleg's nest, about 14 feet up in a solitary poplar tree, on Bear Creek, and as I looked over the edge of the nest I was surprised to see a Long-eared Owl staring me in the face. I pushed her to one side and saw that she was sitting on 5 eggs which were on the point of hatching.

78. ***Asio accipitrinus*.** SHORT-EARED OWL.—Uncommon. About 3 or 4 pairs were located but only one nest was found. This was on the duck island in Crane Lake, and on June 13, 1905, it contained one egg and 9 young in various stages of growth. The nest was surrounded with a great lot of blackbird feathers.

79. ***Bubo virginianus arcticus*.** ARCTIC HORNED OWL.—One pair of Horned Owls was located in 1905, and at least two pairs in 1906, in the heavier timber on Maple and Skull Creeks. One pair had occupied one of the old heron's nests in the Great Blue Heron rookery on Skull Creek and at the time we found it, June 5, 1905, the young had just left the nest; the female and one of the young were secured. The owls seemed to live in harmony with the herons, for there was an occupied heron's nest in the

¹ Concluded from Vol. XXIV, p. 430.

next tree, about 15 feet away. Two more adult Horned Owls were collected on June 25 and 30, 1906.

All of our birds are very light colored, particularly above, where they are fully as light as the average and almost as light as the most typical *arcticus*. On the under parts, however, there is more ochraceous and less pure white than there should be. The legs and feet are somewhat clouded with pale ochraceous and the legs faintly barred with dusky.

If we recognize the large pale owls of the northern prairie States as *occidentalis* Stone, and admit, as Mr. Oberholser claims, that it has both a dark and a light phase, then our birds should, in my opinion, be referred to *occidentalis*, as being nearer that than pure *arcticus*. The status of our birds depends on the relative importance of the characters named, and as they are more or less intermediate between these two forms, I prefer to let them stand as above, for the present at least.

80. *Speotyto cunicularia hypogaea*. BURROWING OWL.—Only 3 pairs were located. A pair was found breeding on the prairie near Crane Lake, and the nest was dug out on June 2, 1905, containing 7 fresh eggs. Birds were also seen at Hay Lake and near Maple Creek. A nest with young was found near Many Island Lake on July 13, 1906.

81. *Coccyzus erythrophthalmus*. BLACK-BILLED CUCKOO.—This species was recorded by Prof. Macoun as far west as Medicine Hat. A Black-billed Cuckoo was seen by Mr. Day in the Skull Creek timber on June 9, 1905. None were collected and no others seen.

82. *Ceryle alcyon*. BELTED KINGFISHER.—Prof. Macoun recorded it as common. Dr. Bishop saw one in Maple Creek on June 16 and another there on July 4, 1906. None were collected.

83. *Melanerpes erythrocephalus*. RED-HEADED WOODPECKER.—Rare. Mr. Day saw one in the Skull Creek timber on June 9, 1905, and Dr. Dwight collected one in the Big Stick timber on July 19, 1906.

84. *Colaptes auratus luteus*. NORTHERN FLICKER.

85. *Colaptes cafer collaris*. RED-SHAFTED FLICKER.—Flickers were very common in the heavy timber along the creeks and were also seen in the Cypress Hills. A nest with 6 fresh eggs was found on May 30, 1905, and nests with young were found on June 5 and 14, 1906.

Practically pure blooded birds of both species were taken and quite a series of hybrid birds showing all the intermediate grades of plumage. Almost all of the males show some traces of the red moustaches of *cafer*, and nearly all show traces of the red nuchal crescent of *auratus*; the other characters seem to be less constant. I collected in 1905 a pure blooded male *auratus*, which was apparently mated, with a nearly pure blooded *cafer* female. Two young in juvenal plumage, one almost pure *cafer* and the other equally near *auratus*, were taken from the same family on June 30, 1906.

86. *Chordeiles virginianus*. NIGHTHAWK.—An adult male was taken by Dr. Bishop at Maple Creek on June 5, 1906, which he called this form. All the others that we took were referred to *sennetti*.

Prof. Macoun called the birds of this region *henryi*, which I am inclined to think was an error. Probably the bird we took on June 5 was migrating, as I believe *virginianus* is the form found farther north in the timbered regions.

87. *Chordeiles virginianus sennetti*. SENNETT'S NIGHTHAWK.—Common in and near the timber belts. None had arrived on June 1, 1905, but they were common on June 5, 1906. A female with eggs was taken in the Big Stick timber on July 19, 1906.

88. *Tyrannus tyrannus*. KINGBIRD.—Common. Found breeding in the timber on Maple and Skull Creeks, also noted in rows of small trees, set out along roadsides and about the ranches. Nests with eggs found June 12, 1905, and June 25, 1906.

89. *Tyrannus verticalis*. ARKANSAS KINGBIRD.—Not quite so common as the preceding in the timber on Maple and Skull Creeks, nesting principally in the larger trees. Nests found, empty on June 12, 1905, and with fresh eggs on June 14, 1905, and June 18, 1906. Noisy and conspicuous birds. They seemed to disappear in July, as the others were not able to collect any during that month.

90. *Sayornis saya*. SAY'S PHEBE.—Uncommon; three pairs located in 1905 and 2 pairs in 1906 about the ranches. A nest was found under a bridge on May 30, 1905. Two nests with fresh eggs were found under the eaves of buildings on June 5 and 10, 1905, and a nest with large young was found inside a small shed on June 24, 1906.

91. *Nuttallornis borealis*. OLIVE-SIDED FLYCATCHER.—On June 8, 1906, after a prolonged and very heavy rain fall, lasting several days and causing Maple Creek to overflow its banks and flood the surrounding plains, we noticed a heavy flight or wave of migrating small birds in the timber along this creek. Among a number of species collected that day and not seen again were 2 Olive-sided Flycatchers, probably belated migrants.

92. *Contopus richardsonii*. WESTERN WOOD PEWEE.—Dr. Bishop took an adult female in the Cypress Hills on July 27, 1906.

93. *Empidonax traillii alnorum*. ALDER FLYCATCHER.—Dr. Bishop referred to this form an adult female which he took in the Cypress Hills on July 27, 1906. This form may also have occurred in the timber on the creeks, but none were collected there. Prof. Macoun called his birds from this region *traillii*.

94. *Empidonax minimus*. LEAST FLYCATCHER.—Very common in the timber on Maple and Skull Creeks. All the small flycatchers that we collected here were this species. One nest was found with 3 fresh eggs on June 25, 1906.

95. *Empidonax wrightii*. WRIGHT'S FLYCATCHER.—Dr. Bishop found it common, with half fledged young, in the Cypress Hills, from July 25 to 30, 1906, and collected a number of specimens. Not collected elsewhere.

96. *Otocoris alpestris leucolæma*. DESERT HORNED LARK.—Very common on the prairies, particularly on the barren hills north of Maple

Creek and on the alkaline plains. No nests were found but fully fledged young, in juvenal plumage, were taken as early as June 13, 1906.

The birds of this region are intermediate between this form and *Otocoris alpestris enthymia* Oberholser. We collected quite a series of Horned Larks most of which, particularly those collected on the prairies in the eastern portion of the region we visited, were nearer *enthymia*, while those collected on the alkaline, sage-brush plains of western Saskatchewan and in Alberta were more typical of *leucolæma*.

This new form described by Mr. Oberholser in 1902 and first noted by Dr. Bishop in North Dakota in 1895, seems to be well marked and worthy of recognition, as the bird of the northern prairie region. But as it has not yet been formally accepted I must list our birds as *leucolæma* (Coues).

97. **Pica pica hudsonia.** AMERICAN MAGPIE.—Magpies were recorded at various points in this region by Prof. Macoun, and we were told by various residents that we should find them in the timber belts, but we failed to see any of them either season. Our only evidence of their occurrence is contained in the following quotation from Dr. Bishop: — "I found the deserted nest of a Magpie about 8 feet up in a clump of willows in the Big Stick timber on July 19. Dwight climbed high enough to see that it was domed."

98. **Corvus brachyrhynchos hesperis.** CALIFORNIA CROW.—A few pairs of Crows were noted, mostly near Crane Lake. Nests containing young were found on June 13 and 17, 1905, and on June 23, 25 and 27, 1906. Dr. Bishop says, "an adult male taken at Walsh, Alberta, July 12, is smaller, with smaller bill, than southern California examples of *hesperis*."

99. **Dolichonyx oryzivorus.** BOBOLINK.—Prof. Macoun found it at the east end of the Cypress Hills in 1894. I saw one at Crane Lake on June 13, 1905, but did not secure it. No others were seen.

100. **Molothrus ater.** COWBIRD.—Very abundant on the prairies, about the ranches and in the timber. Eggs were found in the nests of Western Vesper Sparrow, Clay-colored Sparrow and Western Savanna Sparrow. In one nest of the latter, found on June 23, 1906, were 4 eggs of the Cowbird and none of those of the rightful owner.

101. **Xanthocephalus xanthocephalus.** YELLOW-HEADED BLACKBIRD.—Very abundant in all of the sloughs and on the meadows and prairies surrounding them. Probably the most abundant bird of the whole region, certainly the most numerous in the localities it inhabits, where it fairly swarms. Hundreds of their nests were found in the bulrushes and flags, where the constant din of their voices was the dominant sound, and their striking colors made them always conspicuous. Nests containing eggs were found all through June and some of the young were able to fly as early as June 13, 1905.

102. **Agelaius phoeniceus fortis.** THICK-BILLED REDWING.—Very common around the sloughs and along the creeks, nesting in the flags and long grasses on the edges of the sloughs and in the shallower portions. Nests with eggs were found as early as June 5, 1905.

The series of Redwings that we collected proved very puzzling but we finally decided to refer them to this form, though they were far from typical.

Geographically they should be included under the new northern race, *arctolegus*, as described by Mr. Oberholser in a recent number of 'The Auk.' The measurements of my birds agree very closely with those given for *arctolegus* and they are certainly nearer to this form than to *fortis*, as he gives them.

I should hesitate to recommend the recognition of still another form in a group in which the distinctions are already so finely drawn, but am inclined to think that our birds are referable to *arctolegus* and will help to strengthen its validity as a subspecies.

103. ***Sturnella magna neglecta*.** WESTERN MEADOWLARK.—Abundant on the prairies. Frequently seen sitting on some wayside fence post or telegraph pole, pouring out its rich and beautiful song, a constant source of delight to the prairie traveler. Three nests were found in the long prairie grass, on June 6, 1905, and on June 18 and 24, 1906, each containing 5 or 6 fresh eggs. On July 18, 1906, Dr. Bishop caught a fully fledged young bird, that had been bathing in a lake and was so water soaked that it could not fly.

104. ***Icterus galbula*.** BALTIMORE ORIOLE.—Rare in the timber on Maple Creek. None were collected, but I saw two or three birds each season which I was quite sure were this species, May 29 and June 14, 1905, and June 5 and 30, 1906. I also found an empty new nest there on June 14, 1905.

Both Dr. Bishop and Dr. Dwight doubted my identifications as they did not collect any. But according to Prof. Macoun this species is common here, and specimens were taken by Mr. Spreadborough at Indian Head and Old Wives Creek in 1895.

105. ***Icterus bullocki*.** BULLOCK'S ORIOLE.—The only oriole taken was reported by Dr. Bishop as follows: "I shot a male along the timber near Maple Creek on July 2. This bird is typical [*bullocki*] except that it has the malar region, auriculars and sides of head black and many feathers of sides of neck tipped with black. Probably a hybrid with *galbula*." This may have been one of the birds that I saw and took to be *galbula*. Prof. Macoun says: "Breeding in considerable numbers in trees in the valley of the Saskatchewan at Police Point, Medicine Hat, Assa., May, 1894; not noticed further east."

Probably *galbula* reaches its western limit and *bullocki* its eastern limit somewhere in this vicinity.

106. ***Scolecophagus cyanocephalus*.** BREWER'S BLACKBIRD.—Very abundant in the timber along the creeks, much in evidence and constantly scolding at us. Breeds in the low thick underbrush on the edges of the timber where its nests were so well concealed that we found only one. This contained 5 young on June 30, 1906.

107. ***Quiscalus quiscula æneus*.** BRONZED GRACKLE.—Uncommon in

the timber on Maple and Skull Creeks. One nest was found, in a natural cavity in a box elder tree, containing 5 fresh eggs on June 1, 1905.

108. *Loxia curvirostra minor*. AMERICAN CROSSBILL.— Prof. Macoun reported this species as seen in flocks in the Cypress Hills in June in 1894 and 1895.

On May 31, 1905, I saw a flock of 6 crossbills flying over me among the pines in the Cypress Hills which I suppose were this species, though none were collected.

109. *Astragalinus tristis*. AMERICAN GOLDFINCH.— A pair were taken on Maple Creek on June 30, 1906.

110. *Astragalinus tristis pallidus*. PALE GOLDFINCH.— Goldfinches were fairly common in the timber, especially along Maple Creek, and with the exception of the pair referred to above, all proved to be much nearer *pallidus* than *tristis*. Prof. Macoun, however, recorded *tristis* only.

111. *Spinus pinus*. PINE SISKIN.— I did not see this species at all either season. Dr. Bishop says: "I collected one young of two birds along the timber at Maple Creek on July 2. On July 26 I secured two young birds from a small flock in the Cypress Hills, and heard others occasionally there on other dates."

112. *Calcarius ornatus*. CHESTNUT-COLLARED LONGSPUR.— Very common on the prairies. This and the following species were a constant source of enjoyment and interest; we never ceased to admire their beautiful plumage and their delightful little flight songs, during our long drives across the grassy plains. The habits and the songs of the two species were somewhat similar, but we soon learned to distinguish the males by the color patterns in the tails, which were conspicuous at a long distance. Though their ranges were by no means clearly separated, it seemed to me that this species was more abundant on the more grassy prairies and McCown's was commoner on the more barren plains.

Nests were found with fresh eggs on June 2 and 10, 1905.

Almost all of the Longspurs, of both species, had disappeared from the plains by August first.

113. *Rhynchophanes mccownii*. MCCOWN'S LONGSPUR.— Very common on the prairies in 1906, particularly on the barren hills north of Maple Creek.

We saw very few in 1905, but we spent very little time that season in the localities where we found them so common in 1906. Two nests with eggs were found on June 13, 1906. Their eggs were easily distinguished from those of the Chestnut-collared Longspur but their nests were similar, sunken into the ground in plain sight on the open prairie. They were not easy to find, however.

Their songs were similar to those of the foregoing species but somewhat louder and richer. The male makes about three song flights per minute, of about 8 or 10 seconds duration, feeding quietly on the ground during the intervals of 10 or 12 seconds. He rises slowly and silently to a height of 10 or 15 feet and then floats downward, on outstretched wings and

widespread tail, pouring out a most delightful, rich, warbling, bubbling song.

114. *Poecetes gramineus confinis*. WESTERN VESPER SPARROW.— Abundant on the prairies. Another familiar bird of the grassy plains but not so attractive as the Longspurs. Nests with eggs were found on May 29 and June 3, 1905, and on June 7 and July 12, 1906. A favorite victim of the Cowbird.

115. *Passerculus sandwichensis alaudinus*. WESTERN SAVANNA SPARROW.— Very common on the meadows and around the edges of the sloughs and lakes. Seen occasionally on the higher prairies. A nest with eggs was taken on June 5, 1905, and another on July 6, 1906.

116. *Coturniculus bairdii*. BAIRD'S SPARROW.— Uncommon, but quite a number of pairs were located in the grassy hollows on the prairies. These pairs were widely scattered but we could generally locate them by their peculiar songs in nearly all suitable localities. Their song is somewhat intermediate between those of the Savanna and the Grasshopper Sparrows. The birds are very shy and we experienced some difficulty in collecting them. No nests were found.

117. *Zonotrichia leucophrys*. WHITE-CROWNED SPARROW.— I saw a few and collected one specimen in the Cypress Hills on May 31, 1905. Prof. Macoun recorded them as breeding there.

Dr. Bishop found them in the Cypress Hills, on July 28, 1906, keeping to the summits.

118. *Spizella socialis*. CHIPPING SPARROW.— Rare. I saw two and collected one of them in the Cypress Hills on May 31, 1905. Dr. Bishop also collected one on Mackaye Creek on July 11, 1906.

119. *Spizella pallida*. CLAY-COLORED SPARROW.— Very common in the underbrush along the creeks and among the sandhills. In the latter locality we found 5 nests in one day, June 3, 1905. The nests were in low underbrush, within a few inches of the ground, and almost invariably contained Cowbird's eggs.

120. *Junco mearnsi*. PINK-SIDED JUNCO.— "I secured a female and two young in the Cypress Hills on July 27, and a male and one young several miles away on the following day. No others noted." (Bishop.)

121. *Melospiza cinerea juddi*. DAKOTA SONG SPARROW.— Uncommon in the underbrush along Skull Creek and Maple Creek and in the Cypress Hills.

The birds which we collected were referred to this form, though I doubt if this form will stand the test of a much needed revision of the Song Sparrows of eastern North America. In my opinion there are at least two and possibly three eastern races worthy of recognition. To one of these forms, found on the Atlantic coast, our Saskatchewan birds and the North Dakota birds bear a close resemblance.

122. *Pipilo maculatus arcticus*. ARCTIC TOWHEE.— Uncommon in the Maple Creek and Skull Creek timber. No nests were found. "Tolerably common on Mackaye Creek." (Bishop.)

123. **Zamelodia melanocephala.** BLACK-HEADED GROSBEEK.— On June 14, 1905, in the Maple Creek timber, I heard a grosbeak singing which I thought was a Rose-breasted, but on investigation I was surprised to see a fine male Black-headed Grosbeak; I saw what was probably the same bird later in the day but was too close to it to shoot it. On June 16, 1906, about four miles farther up the creek, I was fortunate enough to find a nest of this species containing 3 fresh eggs, which I secured with the male bird, which was incubating.

Dr. Bishop saw another pair on Maple Creek on July 5, 1906. On Mackaye Creek, July 11, 1906, he and Dr. Dwight secured a pair of the birds and 2 eggs. This species is not recorded as occurring in this region by Prof. Macoun.

124. **Calamospiza melanocorys.** LARK BUNTING.— Not noted at all in 1905, except one doubtful record of a female seen June 2. Very common in 1906 on the prairies and hills north of Maple Creek and about Crane Lake. A nest with 4 young, under a little sage brush, was found on June 23, 1906.

This delightful songster, known as the "Prairie Bobolink," is another of the striking and attractive features of the prairies. Its flight song is particularly rich and joyous. "All through the breeding season each female seen seemed to have at least two males in attendance." (Bishop.) The males were certainly much more abundant, or more in evidence, than the females.

125. **Petrochelidon lunifrons.** CLIFF SWALLOW.— Locally common. A large breeding colony was found in a cattle shed at Reedy Lake. The nests were plastered onto the rough poles, supporting the roof on the inside. Many of them contained fresh eggs on June 10, 1905, and on June 25, 1906. Eggs were found as late as August 2, 1906.

126. **Hirundo erythrogaster.** BARN SWALLOW.— Fairly common about the ranches. Eggs were found on August 2, 1906.

127. **Iridoprocne bicolor.** TREE SWALLOW.— Rare. I recorded a few birds seen in the timber along the creeks in 1905 and saw one at Hay Lake on June 6, 1906. None were collected and none seen by the others in 1906. It was recorded, however, by Prof. Macoun at Indian Head, Crane Lake and Medicine Hat. Mr. Day found a nest with 4 eggs in the Skull Creek timber on June 9, 1905.

128. **Riparia riparia.** BANK SWALLOW.— Common. A few small colonies were found nesting in cut banks or sand pits.

129. **Ampelis cedrorum.** CEDAR WAXWING.— A few were seen, some of which were collected, in the Maple Creek timber on June 30 and July 5, 1906. Others were collected on Mackaye Creek on July 11 and in the Cypress Hills on July 27, 1906.

130. **Vireo olivaceus.** RED-EYED VIREO.— Dr. Bishop saw several and shot one in the Maple Creek timber on June 8, 1906. Recorded by Prof. Macoun as breeding at Indian Head.

131. **Vireo philadelphicus.** PHILADELPHIA VIREO.— One was secured by Dr. Bishop in the Maple Creek timber, on June 8, 1906, in the great wave of migrants that passed through on that day.

132. *Mniotilta varia*. BLACK AND WHITE WARBLER.—Probably a common migrant. We saw a few in the Maple Creek timber on May 29, 1905, which were undoubtedly migrating, as none were seen later. None were collected.

133. *Helminthophila rubricapilla*. NASHVILLE WARBLER.—“In my notes for June 8, 1906, I wrote: ‘saw plainly a Nashville Warbler.’ This bird was within a few feet of me in the timber, and low down, so that I saw it plainly and hardly think I could be mistaken in the species.” (Bishop.) Not recorded by Prof. Macoun.

134. *Helminthophila celata*. ORANGE-CROWNED WARBLER.—Reported as a migrant by Prof. Macoun. “Common in families of flying young in the Cypress Hills, July 25–30. No adult males found. The young were all in juvenal plumage, or moulting into first winter.” (Bishop.)

Dr. Bishop called all his birds *Helminthophila celata orestera* (Oberholser), the Rocky Mountain Orange-crowned Warbler.

135. *Helminthophila peregrina*. TENNESSEE WARBLER.—On May 29, 1905, I saw a bird, within 10 feet of me in the Maple Creek timber, which I was quite sure was a Tennessee Warbler, but none were collected. This species was reported by Prof. Macoun as a common migrant.

136. *Dendroica aestiva*. YELLOW WARBLER.—Abundant in the timber; the commonest warbler. A nest was found building on May 30 1905, and a nest with young on June 30, 1906.

137. *Dendroica auduboni*. AUDUBON’S WARBLER.—Mr. Eastgate shot a female with food in its mouth, in a grove of pines in the Cypress Hills on July 28, 1906.

138. *Dendroica maculosa*. MAGNOLIA WARBLER.—The only one seen was collected in the Maple Creek timber on June 8, 1906, an adult male, probably migrating.

139. *Seiurus noveboracensis notabilis*. GRINNELL’S WATER-THRUSH.—One was taken in the Maple Creek timber, on June 8, 1906, in the wave of migrants.

140. *Geothlypis tolmiei*. MACGILLIVRAY’S WARBLER.—I saw a few in the Cypress Hills, on May 31, 1905, but none were collected. Prof. Macoun reported it as breeding there. Dr. Bishop found it common there in families from July 25 to 30, 1906.

141. *Geothlypis trichas arizela*. PACIFIC COAST YELLOW-THROAT.—Uncommon in the underbrush along the creeks, in the Cypress Hills and in the drier portions of the sloughs. Dr. Bishop referred all the birds taken to this subspecies. Prof. Macoun recorded *brachidactyla* as a common summer resident.

142. *Setophaga ruticilla*. AMERICAN REDSTART.—A few were seen in the Maple Creek timber on May 29, 1905. Probably a common migrant. One was taken on Maple Creek on June 8, 1906.

143. *Anthus spragueii*. SPRAGUE’S PIPIT.—Entirely overlooked in 1905, probably because we did not know where and how to look for it or realize the difficulty of seeing it or hearing it. It was really fairly common on the prairies in 1906, frequently heard and less frequently seen.

The males spend much of their time way up in the sky, almost out of sight, and it is only occasionally that one can be seen, as a mere speck against some white cloud; in the blue sky it is almost invisible. But if one has sharp ears its faint song can be frequently heard. When it descends to the ground, as it does at long intervals, it is very shy and difficult to approach, flying off in long bounding flights. We succeeded in collecting very few birds, though we spent considerable time in fruitless chasing.

144. *Galeoscoptes carolinensis*. CATBIRD.—Fairly common in the timber and underbrush along the creeks. Two nests with heavily incubated eggs were found on June 25, 1906.

145. *Toxostoma rufum*. BROWN THRASHER.—Uncommon in the timber belts in 1906. Not seen at all in 1905.

146. *Troglodytes aëdon aztecus*. WESTERN HOUSE WREN.—Very abundant in the timber along the creeks, where it was the commonest and most ubiquitous bird and one of the most persistent singers. Nests in nearly every available hollow in the box elders. Numerous nests were found each season, with eggs, as early as June 5 and as late as June 30, 1906.

147. *Sitta canadensis*. RED-BREASTED NUTHATCH.—“Heard twice in a tangled thicket at the summit of the Cypress Hills on July 29, a Nuthatch that I believed to be this species. Was unable to get a glimpse of it.” (Bishop.)

148. *Parus atricapillus septentrionalis*. LONG-TAILED-CHICKADEE.—“Tolerably common in the Cypress Hills and the upper part of Maple Creek.” (Bishop.)

149. *Hylocichla fuscescens salicicola*. WILLOW THRUSH.—Common in the timber along the creeks, but very shy. Its Veery song was frequently heard in the dense shady thickets, but we seldom got even a glimpse of the birds and succeeded in collecting only two.

150. *Hylocichla aliciae*. GRAY-CHEEKED THRUSH.

151. *Hylocichla aliciae bicknelli*. BICKNELL'S THRUSH.—In the great wave of migrating birds, that swarmed through the Maple Creek timber on June 8, 1906, thrushes were very numerous. Most of them were probably of these two forms, but only two were collected, one of which proved to be *aliciae* and one *bicknelli*, so that we were unable to determine which was the commoner. Neither form was seen elsewhere or on any other date.

The specimen of *bicknelli* collected was a female and very small even for this race.

152. *Hylocichla ustulata almæ*. ALMA'S THRUSH.—“Eastgate shot an *ustulata*, probably *almæ*, in juvenal plumage, in a thicket of young poplars on the summit of the Cypress Hills on July 27. The parent, though heard, was so shy we could not see her.” (Bishop.)

153. *Merula migratoria propinqua*. WESTERN ROBIN.—Common in the Maple Creek timber. Nests with eggs were found on June 14, 1905, and June 5, 1906.

Prof. Macoun listed the eastern Robin in this region, but all of our birds were *propinqua*.

ERRATUM.

In 'The Auk,' Vol. XXIV, plate xviii, fig. 1, for "Nests of Western Grebe," read "Nests of California Grebe."

RED-SPOTTED BLUETHROAT OF ALASKA.

BY S. BUTURLIN.

IN Part IV, p. 15, of the monumental work of Dr. R. Ridgway, 'The Birds of North and Middle America,' the Alaskan specimens of the Red-spotted Bluethroat are mentioned under the name "*Cyanosylvia suecica* (Linnaeus)."

Though having seen no specimens procured in Alaska I do not hesitate to state, that Alaskan specimens do not belong to the typical form, *Cyanecula* (or *Cyanosylvia*) *suecica suecica* (L.), so common in summer in Scandinavia and northern Europe generally, but are in fact identical with the East Siberian form, named by me¹ *C. suecica robusta* (in Russian in 'Psovaia i Rusheinaia Okhota,' i. e., 'Hunting and Shooting,' 1907, No. 6, published 13 March, p. 87; in German in 'Ornith. Monatsb.,' Maiheft, 1907, p. 79).

First of all, the dimensions given by Dr. Ridgway for Alaskan specimens (*l. c.*, p. 16) are too large for *C. suecica* (L.) typ. but quite agree with those of *C. suecica robusta*, as will be seen from dimensions given below for different forms of this species. Secondly, it must be kept in mind, that Bluethroats are not met with migrating or wintering anywhere in America south of Alaska; therefore it is to be presumed, that birds summering in Alaska migrate in autumn westward to the mainland of Asia, and pass the winter there; but all Bluethroats of Eastern Asia belong to the form *robusta*.

¹ Evidently *after* the fourth part of the great work above mentioned was in print.—S. B.

I procured during the summer of 1905 in the Kolyma's delta (between 69° – $69\frac{1}{2}^{\circ}$ N.) 27 specimens of this bird and carefully compared them with more than 150 specimens from other localities, chiefly in the St. Petersburg Academical Museum, and came to the conclusion, that there are three fairly distinguishable subspecies or geographical forms.

1. Small pale Caspian form, *C. suecica pallidogularis* Zarudn. (= *C. discessa* Madar.). Paler than typical form, especially the blue of the throat in the males very pale, wing in ♂ about 69–71 mm., exceptionally larger, but only 1 spec. out of 16 ♂♂ examined had it 73.5 mm., long; tarsus 26–28.

This form breeds in southeastern Russia from (including) Khar'kov Governm., where it meets however the typical form, through Caucasus and Transcaucasia and Transcaspiian Province on one side and lower Ural and part of Kirghiz Steppe on the other as far east as Zaissansk in N. E. part of Russian Turkestan (about 47° N., 85° E. fr. Greenw.). Seasonal migrations of this form are quite limited.

2. Typical European and West-Siberian form, *C. suecica* (L.) typ. Darker and larger than Caspian form, wing of ♂♂ normally 72–74 mm., rarely smaller, down to 70 mm., and only in 2 specimens among 50 males examined larger—up to 77 mm.; tarsus 26.5–27, only in 2 specimens (others, not those just mentioned) among fifty longer—up to 28 mm. Breeds from Scandinavia eastwards up to Yenesei, and much further south than generally supposed: down to 50° N. in Central Russia, as well as in Russian Turkestan (higher up hills, than *C. pallidogularis*), Yarkand and even Tibet. Winters in Africa and India.

3. Large, East Siberian form, *C. suecica robusta* Buturl. It is just a shade darker than the typical form, especially the rufous spot on the throat of males is darker, more rusty-chestnut tinged (but this color difference observable only in comparing series of skins). Wing of males about 74–78 mm. long, very rarely (in 4 specimens among forty) less, down to 72 mm. Tarsus 27.5–28.5 mm. long (only 1 specim. among 40 examined—and this single bird not one of four small-winged birds just mentioned—had tarsus shorter: 26.5 mm.). Breeds from upper (eastern) parts of Lower Tunguska valley and Monjero (*i. e.*, about from 100° E.

fr. Greenw.) eastwards, including Chukchi land and Anadyr River (and evidently Alaska), wintering in China.

WESENBERG, ESTHONIA,
RUSSIA, Oct. 17, 1907.

THE GENERIC NAMES *MYCTERIA* AND *TANTALUS* OF LINNÆUS, 1758.

BY J. A. ALLEN.

THE genera *Mycteria* and *Tantalus* of Linnæus, as originally founded (Syst. Nat., ed. X, 1758, p. 140), were both monotypic, *Mycteria* having the single species *M. americana*, and *Tantalus* the single species *T. loculator*. *Mycteria* (No. 74) has precedence, standing above *Tantalus* (No. 75) on the same page. The names *Mycteria americana* and *Tantalus loculator* both unfortunately relate to the same species, as long since pointed out by Lichtenstein, and later by others.

Mycteria americana Linn. has for its sole basis Maregrave's *Jabiru-guacu*, which Lichtenstein states (Abhandl. Berlin Akad. Wiss., Phys. Kl., 1816-1817 [1819], p. 163), on the basis of the original manuscript and drawings, "ist *Tantalus Loculator*, den die Figur auf p. 200 vorstellt." *Tantalus loculator* is based on the Wood Pelican (*Pelecanus sylvestris* on the plate) of Catesby's 'Carolina.' As explained by Lichtenstein, and as is evident on inspection, Maregrave's figures on pages 200 and 201 of his 'Historiæ rerum Naturalium Brasiliæ' are transposed, so that his figure of the Jabiru is placed on p. 201, in the text relating to the Jabiru-guacu, and the figure of the latter in the text relating to the Jabiru. Linnæus makes no reference to the Jabiru, which Lichtenstein here (*l. c.*) named *Ciconia mycteria*, its first tenable systematic designation. Linnæus was thus misled into identifying the figure of the Jabiru as that of the Jabiru-guacu, he evidently basing his generic diagnosis on the wrongly placed figure of the Jabiru and his specific diagnosis on the description of the Jabiru-guacu, which is the Wood Ibis, his *Tantalus loculator*.

In accordance with universal custom, the amended Article 30 of the International Code of Nomenclature provides: "A genus proposed with a single original species takes that species as its type." Hence the type of *Mycteria*, regardless of the generic diagnosis, is *M. americana*, based on the Jabiru-guacu of Marcgrave, the Wood Ibis, of which, by virtue of its position on the same page, *Tantalus loculator* is a synonym. The proper name of the Wood Ibis is therefore *Mycteria americana*. The Jabiru being thus nameless, so far as Linnæus is concerned, must bear the generic name *Jabiru*, provided for it by Hellmayr in 1906 (Abhandl. d. K. Bayer. Akad. der Wiss., II Kl., XXII, Abt. 3, 1906, p. 711), and the specific name *mycteria*, given it by Lichtenstein (*l. c.*) in 1819 = *Jabiru mycteria* (Licht.) Hellm.

Marcgrave's *Jabiru brasiliensibus* is a large bird, with the bill eleven inches long and the legs two feet long, and entirely white, with the head, and also the neck for eight inches, naked, the skin black for the upper half and white for the lower half.

His Jabiru-guacu is a smaller bird, the size of a stork, with the bill seven and a half inches long and the legs about fourteen inches long; there is a bony mitre or crown on the top of the head; the neck is ten inches long, the upper half of which, together with the head, is not covered with feathers but with a scaly gray skin, the scales being whitish. It is also a white bird, with the tail and wing-quills black with a purplish gloss. Linnæus's *Mycteria americana* is described as: "Magnitudo Ciconiæ, alba, remigibus rectricibusque nigro-purpurascens." Evidently this is based on Marcgrave's "caudam habet brevem et nigram," and "Alæ albæ, remiges illarum pennæ nigræ, rubino colore transplendente in nigro," in his description of the Jabiru-guacu.

The Jabiru-guacu has sometimes¹ been identified with the Maguari, *Euxenura maguari* (Gmel.), which has, however, a feathered and not a naked head and neck, and no horny shield on the head; but in size, and in the coloration of the wings and tail, the birds are similar; but 'tail short' applies better to the former (or Wood Ibis) than to the latter, and the bill is curved (shown in Marcgrave's figure), as in the Wood Ibis, and not straight and stork-like, as in the Maguari.

¹ Cf. Ridgway, Bull. U. S. Geol. and Geogr. Survey Terr. (Hayden), IV, 1878, 250; Berlepsch, Journ. f. Orn., 1887, 32.

THE BIRDS OF CUSTER AND DAWSON COUNTIES, MONTANA.¹

BY E. S. CAMERON, F. Z. S. L., M. B. O. U.

134. *Poecetes gramineus confinis*. WESTERN VESPER SPARROW.—Tolerably common; arriving about the end of April. A few remain to breed. On June 17, 1896, I found a nest (a deep cup in the ground amidst the sage brush), containing three eggs of this sparrow and three of the Cowbird.

135. *Passerculus sandwichensis alaudinus*. WESTERN SAVANNA SPARROW.—Captain Thorne gives this bird as common and breeding. I have only come across it two or three times at the migration periods.

136. *Coturniculus bairdii*. BAIRD'S SPARROW.—An irregular fall migrant. I have observed this sparrow on the prairie in large numbers during September, but have no notes of its occurrence at any other time. A flock frequented the garden at my ranch, Custer County, in September, 1893. They were preyed upon by a Sharp-shinned Hawk, and by the cat, which on the thirteenth brought me two good specimens. Measurements in inches were: length $5\frac{1}{2}$; wing scarcely 3; tail $2\frac{3}{4}$; extent $9\frac{1}{4}$. Feet and legs flesh color, fading to pale brown. Bill flesh color, with culmen dark brown. Iris black. A large flock arrived at another ranch where I lived near Terry, on September 6, 1902, and remained for four days, thus affording an ample opportunity for watching them. These birds are very fond of perching on buildings and fences. Unless specimens are shot for identification it is often difficult to diagnose the countless flocks of migrant sparrows which flit through the sage brush. Nevertheless I believe that this species without yellow at the bend of the wing is much commoner than the previous bird. Baird's Sparrows came to drink at my water-troughs in Dawson County during September, 1905.

137. *Coturniculus savannarum perpallidus*. WESTERN GRASSHOPPER SPARROW.—Rare. I have seen this Sparrow once only, on September 16, 1904, when one came to my water-troughs in Dawson County, in company with Clay-colored Sparrows and Chipping Sparrows.

138. *Chondestes grammacus strigatus*. WESTERN LARK SPARROW.—Very abundant summer resident in both counties.

Lark Sparrows arrive early in May, and are the most pugnacious little birds I have ever seen. The cocks fight on the ground or in the air indifferently, and are then so oblivious to their surroundings that five or six fighting on the wing have nearly hit me in the face. When all other birds are suffocated by the heat, and even the doves are unable to coo, Lark Sparrows keep up their continuous harsh croaking and indulge in

¹ Concluded from Vol. XXIV, Oct., 1907, p. 406.

brief combats. On my first coming to Montana, these birds, so numerous and tame about ranch buildings and doors, reminded me of the sparrows on English farmyards. I have found their nests, which are invariably placed under a sage bush, and lined with grass, in pine hills, badlands, and open prairie. On an average the full clutch of five eggs is laid by the middle of June, and the young are fledged in the middle of July. The female incubates about twelve days. I have also seen eggs in July, but these were doubtless for a second brood. In the pairing season, the males give a sort of display, during which they bow, strut and spread their long tails.

139. *Zonotrichia querula*. HARRIS'S SPARROW.—Rare. I observed a single Harris's Sparrow associating with White-crowned Sparrows on May 24 and 25, 1907, near Knowlton, Custer County.

Captain Thorne has the following: "Seen only in the fall of 1889 (September 22, to October 13). All I took were juveniles."

140. *Zonotrichia leucophrys*. WHITE-CROWNED SPARROW.—Tolerably common in both counties. A very regular spring migrant. Notes kept for a number of years show that it almost always arrives during the first week in May, and may remain until the end of the month. To my knowledge, it has only once arrived in April — on April 21, 1900. These sparrows used to sit in the brush at my north window (see introduction), and lent by their presence a further charm to the flowering choke-cherries. In my opinion they are the handsomest sparrows which visit Eastern Montana.

White-crowned Sparrows are not often observed here on the fall migration, but I have a few records of their appearance about the end of September. I found them more numerous on October 1, 1893 (the occasion of the first snowstorm), than at any other time. Associated with Juncos, separate flocks were seen, at intervals, for a mile down the creek, on my ranch in Custer County. White-crowned Sparrows are birds of the river bottoms, and merely pass through the pine hills.

141. *Zonotrichia leucophrys intermedia*. INTERMEDIATE SPARROW.—Captain Thorne states that this sparrow is "tolerably common in spring and fall." I have not noticed it.

142. *Zonotrichia albicollis*. WHITE-THROATED SPARROW.—Rare migrant. I saw a pair on Fallon Creek, Custer County, September 6, 1896.

143. *Spizella monticola ochracea*. WESTERN TREE SPARROW.—Abundant on the migrations in both counties. May arrive at any time from the end of February to the end of March. I have not seen this sparrow in December or January, although Captain Thorne gives it as "usually abundant during the colder months." Very erratic, remaining for a few days or for a month.

On March 26, 1907, near Knowlton, Custer County, a flock of about 250 Tree Sparrows arrived early in the morning during a snowstorm. At first, this large flock split up into small companies of from 25 to 50 in each, which came boldly to the windows and doors, covered the roofs of the

buildings, and perched on the withered horse-weed stalks. Afterwards, they mixed with an army of Horned Larks, when this host of birds, numbering many hundreds, spread over some three acres of ploughed land which was entirely overgrown with Russian thistle—a most noxious weed. At the same date, a flock of about fifty birds frequented the adjoining ranch of Mr. J. H. Price. These sparrows remained during the entire month of April. Tree Sparrows are again seen about the middle of October, and immense flights, mixed with a few Juncos, then pass through the scattered pines. Their progress is slow, as the flocks constantly alight to feed on a plant which covers the hill sides; doubtless the same weed alluded to by Dr. Coues in his graphic account of Tree Sparrows feeding. (*Birds of the Northwest*, p. 147, 1874.)

144. **Spizella socialis.** CHIPPING SPARROW.—Very abundant summer resident. It may be seen in countless flocks on spring migration. One of the largest invasions of Chipping Sparrows was in 1893, when they arrived at my ranch in Custer County, on March 11, and continued to come in ever increasing numbers until the climax was reached on April 7, the occasion of a howling blizzard. Then an army of Chipping Sparrows and Desert Horned Larks, over a thousand strong, took possession of a disused garden to feed upon a wild plant with a seed like millet locally called “horseweed.” All that morning a seemingly continuous stream of these small birds poured in, and, as I had never before seen so many together, I sallied out to watch them although scarcely able to face the storm. They were remarkably tame and Mr. H. Tusler, of the ranch above, twice caught three Horned Larks with a five-pronged stable fork, by laying it on another similar flock which visited him. The scene at my ranch was rendered still more interesting by the manœuvres of three Marsh Hawks, a Sparrow Hawk and a Northern Shrike, which continually harassed this immense company of birds, but though they killed a good many Horned Larks I could not discover that any Chipping Sparrows were taken. Our cat, however, captured many specimens of the latter, which she brought to me.

Exceptionally large flights of Chipping Sparrows were noticed at my ranch in Dawson County in 1905 and 1906. In 1905, flocks of unusual size began to arrive on May 10, and on May 16 the birds, mixed with Clay-colored Sparrows, swarmed over the neighboring country. When we were riding through the hills at this date, the horses constantly flushed hundreds of both species from the sage brush at their feet. On May 17, 1906, Chipping Sparrows passed throughout the day, flying low to the northwest across a strong north wind. These late migratory movements have no connection with the resident birds, which arrive in March. Chipping Sparrows nest here in low cedars, but occasionally in sage brush, and rear two broods in the year. In July numbers may be seen feeding the full-fledged young upon grasshoppers, while others are sitting upon three or four eggs. I have never seen more than the latter number, and three is usual. The earliest date at which I have found eggs is May 28,

and the latest July 15. I have several times seen a Cowbird's egg among those of the sparrow.

At the water-troughs on my ranch in Dawson County there are excellent opportunities for observing the habits of these sparrows, as several pairs nest annually in the cedars which grow around them. The nests are usually slight, unfinished structures of dried grasses, but may be more elaborate with horse and cowhair interwoven. As with other birds here, the partially feathered nestlings suffer much from the sun's rays and the parents shade them. In July, 1904, an Arkansas Kingbird and a Chipping Sparrow sat on nests side by side in two opposite forks of the same cedar branch. I have never observed Chipping Sparrows here after the first week in November. This form is referable to *socialis* and not to var. *arizonæ*, as the adult males have the crown continuous bright chestnut.

145. *Spizella pallida*. CLAY-COLORED SPARROW.—Common sometimes on the spring migration; rare at other times. On May 16, 1905, hundreds passed in company with Chipping Sparrows when our cat brought in a good specimen. Measurements in inches were: Length 5; extent $7\frac{1}{4}$; wing $2\frac{3}{4}$; tail $2\frac{1}{2}$. Captain Thorne gives it in his list as breeding. I observed these sparrows at different dates during August and September, 1904, associating with Chipping Sparrows.

146. *Spizella breweri*. BREWER'S SPARROW.—Captain Thorne gives this sparrow as "Common, breeds." I have not recognized it.

147. *Junco hyemalis*. SLATE-COLORED JUNCO.—Common spring and fall migrant. Capt. Thorne states that some remain to breed but I have never found a nest. At my ranch in Custer County, Juncos arrived in large numbers early in April, and were exceedingly tame; they associated with Desert Horned Larks and Chipping Sparrows about the buildings. In April, 1893, the female of a pair which frequented the stable perched on a horse's ear, and in April, 1896, I twice caught a Junco in the stable with my hand. When the weather became warm they all departed to reappear again about the first of October. Juncos do not care to stay long in the pine hills, and I have only noticed small flocks of passing migrants at my ranch in Dawson County.

148. *Melospiza fasciata*. SONG SPARROW.—Rare. I have no records. Captain Thorne gives: "One female taken April 16, 1889."

149. *Melospiza lincolni*. LINCOLN'S SPARROW.—Rare. On May 10, 1897, two were seen in the shrubbery at my window (Custer County). On August 27, 1904, two came to my water-troughs in Dawson County. Captain Thorne saw it twice only in 1889.

150. *Pipilo maculatus arcticus*. ARCTIC TOWHEE.—Common in both counties. Nested on both my ranches. The average time of arrival is during the second week in May, the 6th being the earliest date I have recorded. The grass nests of Towhees are placed on the ground in clumps of wild roses or sage brush and contain four or five eggs. These are laid about the middle of June; nestlings are hatched at the end of the month, and fledglings may be seen flying about in August. All the birds leave at

the end of September. On June 20, 1898, I found a nest in a rose bush which contained five eggs of the Towhee and two of a Cowbird.

Towhees are very common in the woods along the Yellowstone bottom, but are shy birds, flitting about in dense cover, although their harsh croak resounds on all sides.

151. *Zamelodia melanocephala*. BLACK-HEADED GROSBEAK.—Captain Thorne records this species as "Tolerably common. Breeds." I have never seen it.

152. *Cyanospiza amcena*. LAZULI BUNTING.—Tolerably common summer resident in both counties. Appears to be a very irregular migrant, as I have recorded its appearance at varying dates from April 19 until the middle of June. I never saw it in Montana until 1896. Lazuli Buntings nest in the hollows of dead pines in places similar to those chosen by Flickers, and also use the deserted nesting holes of other species. On June 12, 1904, six young flickers fell victims to some predatory animal (it was supposed to be our cat), in their hole in a burnt pine near my house in Dawson County. Thereupon a pair of Lazuli Buntings made their nest of dried grass, lined with feathers, in the same situation on July 2, and four eggs were laid. Another pair took possession of a hole in a dead pine which in the previous year (1903) had been occupied by a pair of Chickadees. I once found the nest of Lazuli Buntings in a hole in a sand rock cliff, but this struck me as a rare occurrence. The full complement of eggs is five. Lazuli Buntings hover like Kestrels on the open prairie when searching for grasshoppers or grubs on which to feed their young. They leave about the first of October.

153. *Calamospiza melanocorys*. LARK BUNTING.—Commonest of the summer residents in Custer County, arriving about the second week in May. It is invariably called Bobolink, and is confused with that bird. The males precede the females by about five days and, when all have arrived, flying hosts are seen strung out for about a quarter of a mile. Lark Buntings are common in Dawson County, but I have not noticed them in such immense numbers as in Custer. Although essentially prairie birds, the flocks rest in the trees when migrating through pine hills. Their nests are more plentiful in fenced pastures than elsewhere, a fact explained by the bird's fondness for perching on the wires. I have observed five nests in one small pasture when riding through it, and, had search been made, doubtless many more might have been discovered. The usual number of five eggs is laid by June 1 and the male shares the duties of incubation with his mate. The young are fledged by July 1, and, as soon as they can fly weakly (about the middle of the month), sit on the wires with their parents which feed them on grasshoppers. A nest on my ranch in Custer County, contained three eggs on May 25, seven eggs on May 29, and six newly hatched young on June 10, which makes the time of incubation about twelve days. Before the flocks leave in the fall the males have assumed the plumage of the females.

The Lark Bunting sings loudly on the wing and, as Dr. J. A. Allen has

pointed out: "In its song and the manner of its delivery it much resembles the Yellow-breasted Chat [*Icteria virens*], like that bird rising to a considerable distance in the air, and poising itself by a peculiar flapping of the wings during its utterances, then abruptly descending to the ground to soon repeat the manœuvre." (Birds of the Northwest, by Elliott Coues, p. 164, 1874.)

154. **Progne subis.** PURPLE MARTIN.—Not common. Martins have nested for many years at the ranches of Messrs. Heywood, Daly and Harry Schlosser near Knowlton (Custer County) where boxes have been provided for them. The birds arrive about May 15. Mr. and Mrs. Bowman have watched Bronzed Grackles stealing their eggs. Mrs. W. S. Haley has observed Purple Martins in Dawson County. Two were seen by me among cottonwoods of the Yellowstone near Terry on June 7, 1905. Dr. J. A. Allen found Purple Martins more or less frequent along the Yellowstone from the mouth of Tongue River to Pompey's Pillar, August 1st to 15th.¹ In his 'Birds of Fort Custer' (which four years ago was within Custer County boundaries), Dr. Edgar A. Mearns gives them as "Numerous in the timbered river bottom."²

155. **Petrochelidon lunifrons.** CLIFF SWALLOW.—Very abundant in both counties. My records show that it arrives at varying dates from May 7 to May 27. Nests in colonies on buildings at almost all ranches where allowed to do so, in the badlands, and against vertical cliffs above the Yellowstone. There have always been large colonies nesting around the Northern Pacific engine tank and section house at Terry. Two broods are raised in the year. Mr. Walter Lindsay, of the Cross S ranch on Mizpah Creek, informed me that in 1888, a rattlesnake climbed the veranda poles and devoured all nestling swallows within reach.

Some ranch owners unwillingly sweep down Cliff Swallows' nests under the impression that their presence brings bedbugs into the houses. While this is denied by scientists I am compelled to believe it, as so many impartial investigators have assured me that the introduction of such vermin synchronized with the first nidification of the birds.

156. **Hirundo erythrogaster.** BARN SWALLOW.—Common in both counties. Records kept since 1893 show that the average date of arrival near Terry is May 13. This is one of the best known birds; I think it would be impossible to find a ranch without swallows nesting in the stable or outbuildings, and even in rooms to which they can gain access. Barn Swallows generally rear two broods a year, of four or five in each, and the last nestlings may not be full-fledged until the end of August. The young birds fly about during the day but return to their nest at night, and those that cannot find room inside sit about near it on the stalls. I thought it a remarkable circumstance that in 1902 a single pair of swallows built two nests in my stable near Terry, the second above the other and a little

¹ Notes on the Natural History of portions of Montana and Dakota, 1874.

² Condor, Vol. VI, p. 21, 1904.

to the left. When the five nestlings became full-feathered (on August 2) they were inconveniently crowded, and two contrived by some means to reach the upper nest, remaining there until August 9, when all could fly.

157. *Iridoprocne bicolor*. TREE SWALLOW.—Rare. Dr. J. A. Allen found this swallow: "Common at one locality on the Musselshell, but not seen elsewhere."

Captain Thorne mentions that some of these swallows nested at Fort Keogh. I never happened to recognize this species in Montana, although I have seen it just across the line in Wyoming. Mr. Dan Bowman has observed these birds on the Powder River and recollects a pair having a nest in the roof of an old shed in the eighties. He further informs me that during the end of May, 1894, a pair of Tree Swallows frequented a Martin box on a high pole, placed by a cottonwood, on his Powder River ranch. The hopes that they would nest there were not fulfilled.

158. *Tachycineta thalassina lepida*. NORTHERN VIOLET-GREEN SWALLOW.—Dr. J. A. Allen met with this species "near the mouth of Tongue River, and frequently on the Yellowstone above this point." In his 'Birds of Fort Custer' Dr. Edgar A. Mearns gives this swallow as: "Abundant along the bluff bank of the Bighorn River." Mr. Dan Bowman has seen it on the Powder River but cannot give dates. I have not observed it.

159. *Riparia riparia*. BANK SWALLOW.—Not common. Dr. J. A. Allen found a "large colony on the banks of the Yellowstone, near the mouth of Custer Creek (Custer County). Here full-fledged young were obtained August 1st." At the present time I only know of one colony, in a cut-bank on a tributary of Whitney Creek, Custer County. Other nesting sites I have come across were deserted, but Mr. Dan Bowman has seen colonies elsewhere. This is the same bird as the Sand Martin in Great Britain.

160. *Ampelis garrulus*. BOHEMIAN WAXWING.—Abundant. A most interesting and predominant winter resident. I have met with large flocks everywhere in both counties from the Powder River to the Missouri. "Professor Baird mentioned that Mr. Drexler saw 'millions' on Powder River, in flocks rivalling in extent those of the Wild Pigeon."

Bohemian Waxwings arrive about the end of October and leave about the end of March, thus being with us for five months. At my ranch near Terry flocks came to my north window, where the bright-plumaged birds presented a charming sight from within the room as they picked off the remnant of withered cherries amid the snow-weighted cotton of the ele-matis. In Dawson County Waxwings were constant visitors to my water troughs. They are among those species which always try to get water even when deep snow covers the ground. At Knowlton during the severe winter of 1906-07 a flock came regularly to a large open spring at Messrs. Archdale's ranch. When hunting mule deer on Cedar Creek (which

risers in Custer County, but runs into the Yellowstone in Dawson County) I had daily opportunities of observing thousands of Waxwings which frequented the extensive thickets surrounding my camp. Here they subsisted entirely on cedar berries, which have a sweet taste and tinge the excrement of the birds red, so that familiar roosting places in the high pines are infallibly marked by the red-stained snow beneath. In general the winter food of Waxwings consists of cedar berries, buffalo berries, and wild rose hips, in this respect entirely coinciding with that of Sharp-tailed Grouse which are also very numerous in these woods. The latter birds were a great nuisance to me when still-hunting deer, for, although the complacent Waxwings never gave the alarm, the Grouse, when disturbed, flew into the trees in a spray of snow and with a most unnerving cackle — a signal for all the deer within ear shot to “quit the country.” When following a fresh deer trail a flock of Waxwings would shoot over an opening but a few feet above my head, and alight, despite my presence, to pick off the berries near at hand. On these occasions I have seen the old birds feed the young ones as late as the end of January. The loud rushing noise of their wings swept through the silent cedars with a familiar and welcome sound which the deer were unaccustomed to associate with danger. As these Waxwings had no fear of man, their perplexing plumage could be examined at very close range. Only a small proportion had yellow primary bands; in the great majority these were white. Most birds had no red sealing wax appendages visible and were presumably the young of the year. Others, besides showing white edging to the ends of all the primaries except the two first, had four wax tips on the secondaries. These may have been birds of eighteen months old which had moulted twice, having regard to the fact that the Waxwing moults only once a year — in October. A few of the birds had brilliant yellow wing-bars and numerous vermilion appendages, and I concluded that this small minority were old birds. “The fullest information on this subject is to be found in a paper by the late Henry Stevenson of Norwich, published in the ‘Transactions of the Norfolk Naturalists Society’ (Vol. III, pp. 326–344). He dissected sixty-eight specimens of the Waxwing — forty-one males and twenty-eight females — and found that the number of waxlike tips on the wing feathers is variable. Of the males examined, three had four tips; seven, five; fourteen, six; fourteen, seven; and three, eight tips. Of the females one had two tips; four, three; seven, four; six, five; seven, six; two, seven; and one, eight tips.”¹

Waxwings, more than any other small birds here, appear to fly for the mere pleasure of flying. When snow lies thick upon the branches of the cedars, and is held imprisoned between the needles of the pines, while in the frosty air outside long streamers of blue, red, and yellow light radiate from the sun, these birds are constantly on the wing. The flock selects a

¹ Natural History Editor of London Field, Feb. 18, 1893, in reply to a correspondent.

tree from which at intervals the birds gyrate in widening circles, sometimes altogether and sometimes only a part of them, as though impelled to exercise for the sake of warmth on such a wintry day. They seem to prefer dead trees, most likely because the view from them is less obstructed, and are so densely massed that an incredible number might be killed by a shot. Although they habitually rest in trees, I have twice seen a large flock alight on the ground, but regard this as very unusual. Waxwings have always an abundance of food, and can support extreme cold as well as any of the circumpolar birds. Nevertheless, at times I have seen them greatly affected by it. Some such days indeed I shall always remember, one especially in January, 1896, when a blizzard from the north, combined with the low temperature of 31° below zero Fahrenheit and deep snow, made discouraging atmospheric conditions. Not caring to stay in camp, and wanting meat, I had gone out on foot in the endeavor to shoot a deer. The whirling snow from below met that driven from above, so that an encompassing snow-cloud hid all objects outside the cedars, while the view inside, usually curtailed, was now clearest in their sheltering depths. As may be supposed, all the animals on the adjacent plains had crowded into this haven, even such unlikely visitors as antelope and Sage Grouse. I saw altogether nine deer, one in picturesque pose eating cedar berries only a few yards distant, but so intense was the cold I found it impossible to discharge my rifle. On this day and other similar days, the Sharp-tailed Grouse never left their burrows at all, and the Waxwings were so stupefied as scarcely to move out of my way in the brush. It is in weather of this kind that they become the prey of ranch cats. A very fine male which our cat brought to me on Feb. 13, 1899, was quite fat after eighteen days of a cold wave during which 45° below zero was registered. I do not think that many Waxwings fall victims to Prairie Falcons, as they betake themselves to thick cover when the latter are about. On March 6, 1904, my wife and I approached within two yards of a flock of Waxwings, which refused to leave a low cedar when a Rough-legged Hawk was sailing above. The winter of 1906-07 was the most severe in my Montana experience, and Waxwings, tamed proportionately to the cold, frequented the haystacks and corrals at Knowlton in company with flocks of Horned Larks and Snowflakes. They even entered the town of Miles City, and Mr. H. B. Wiley wrote, under date of Feb. 4, 1907: "I found a bunch of about fifty Bohemian Waxwings in my yard eating the frozen apples."

As the migration period approaches Waxwings become very restless and fly backwards and forwards with great swiftness. Unusually warm weather deceives them into the belief that spring has come, when they adopt a direct mode of flight instead of circling. When flying the birds keep up an incessant twittering, so that high passing flocks are immediately recognized by their call of *zir-r-r-r* — a sort of trill. Seebohm writes the notes *cir-ir-ir-ir-re* and compares them to the song of the Redpoll.¹ The

¹ British Birds, Vol. II, p. 5.

weak voice of a single Waxwing is inaudible except at very close quarters, but hundreds together produce quite a volume of sound.

161. **Ampelis cedrorum.** CEDAR WAXWING.—Tolerably common summer visitor in both counties. Notes kept from 1894 show that it arrives regularly during the first week of June, and once (in 1906) on May 31. Very few pairs remain to breed but transient flocks, of from twenty to thirty birds, occur which make a twittering similar to the Bohemian Waxwing. Two or three pairs of these flocks remained throughout the summer on my ranch (Custer County), which was a favorite haunt of Cedar Waxwings, both on account of the thickets of wild fruit trees and the abundance of water and shade on which these birds seem very dependent.¹

At the time of writing (1907) I am not aware that Cedar Waxwings (which are the latest breeders of any birds here) nest anywhere else in the two counties. In August, 1899, I paid particular attention to Cedar Waxwings, as a small flock of twenty birds had been about the ranch since June 1. One pair made a nest in a thicket below the house and the female was sitting on three eggs on August 19. The nest would not have been discovered but for the actions of the male bird which was constantly perched on the top of an old box elder which towered above all the other trees in the grove. This induced me to search diligently below until I found the nest, a large structure of coarse grass and twigs, which was interwoven with four small shoots of a young box elder and thus held tightly against the parent stem. The young Waxwings seemed to mature very quickly, for although their feathers had only just begun to show on August 26, on September 2 I saw them leave their nest and all fly up into the tree at my approach. In color they were plumbeous gray, with some black about the head, a yellow border to the tail, but no sign of a crest. The whole family remained in the vicinity of the nest for some days, and I saw the parents feeding the young on grasshoppers, which are the universal 'stand-by' of almost every bird here.

These Cedar Waxwings had an extraordinary characteristic, that of drawing themselves to their utmost height, and standing perfectly rigid on a branch with closed eyes, when they appeared dazed or blind. I have remarked this practice in caged canaries, but never before in wild birds. The female indulged this habit to a ridiculous extent, before her nestlings were fledged and, whereas the more wary male took care to keep well out of my reach, she allowed me to set up a camera a few feet away, and to move around her as close as I pleased without taking any notice unless almost touched. In this respect the newly fledged young imitated her. Perched in a row along a branch, with the male higher up in the tree, this was indeed the most impassive bird family I have ever seen. An attempt to catch a fledgling could alone arouse them from their trance, in which event the excited parents would alternately raise or depress their

¹ See introduction, Auk, Vol. XXIV, p. 246.

crests, while all the birds would start in chorus with their "low lisping call."

162. **Lanius borealis.** NORTHERN SHRIKE.—Not common but seen at intervals in fall, winter and spring. It possesses great strength, and will attack birds as large as itself. On April 8, 1893, I saw an impaled Horned Lark in a Shrike's larder on a low bush. On March 26, 1904, I saw a Shrike hawking a Redpoll just as a Falcon would do. The unfortunate Redpoll ringed higher and higher in vain efforts to keep above its pursuer, which, after twice almost seizing the quarry in mid-air, compelled it to fly straight for about half a mile. The exhausted Redpoll then took refuge in high sage brush closely followed by its assailant. On October 16, 1906, a Tree Sparrow pursued by this Shrike found refuge in the cedars surrounding my water-troughs in Dawson County. Its victim having escaped, the Shrike sat on a branch and permitted me to examine it at close range.

This Shrike has a pleasing song which may be heard in winter after all the migratory song-birds have left.

163. **Lanius ludovicianus excubitorides.** WHITE-RUMPED SHRIKE.—Common and ubiquitous summer resident of both counties. One of our tamest and most confiding birds which alights on the wood pile, or any where at the ranch door in close proximity to human beings. There were usually two Shrikes' nests on Ash Creek, on which my ranch near Terry was situated. A nest found June 25, 1894, containing five young birds nearly ready to fly, was wedged between two upright cottonwood stems above the water, and appeared to be in a precarious situation. It was, however, really supported from below by a small snag.

In 1898, this peculiar site was again chosen by the Shrikes, and six eggs were laid by June 16. Another nest near the above, in the fork of a box elder, contained three newly hatched nestlings at the same date. These birds kept well out of the way when I was in their vicinity, and thus differed from another pair which nested annually in a cedar on my Dawson County ranch. The latter fiercely resented any approach to their nesting site, and would fly straight at me, chattering and snapping their bills, on the few occasions that I disturbed them. Indeed, after the young were hatched, it was necessary to protect my head from the female with my hands.

164. **Vireo olivaceus.** RED-EYED VIREO.—Tolerably common on the spring migration. I have not found it breeding in either county. In his list above quoted Dr. J. A. Allen states that this species is "Common wherever there is timber, from the Missouri to the Musselshell." A mixed flock of these Vireos and Yellow Warblers arrived at my ranch (Custer County) on May 20, 1893. (See also No. 165.)

165. **Vireo gilvus.** WARBLING VIREO.—Tolerably common in spring. Captain Thorne says that it breeds, but I have not found a nest nor observed this bird after the end of May. On May 16, 1899, at my ranch (Custer County), a flock mixed with Red-eyed Vireos were flying north,

when some entered the open door of the netted-in veranda and became prisoners.

Warbling Vireos were visitors to my water-troughs in Dawson County. I have noticed them eating wild rose leaves.

166. *Helminthophila celata*. ORANGE-CROWNED WARBLER.— Captain Thorne gives this warbler as "common in April and May." I have seldom seen it. About half a dozen of these birds were observed by me associating with Yellow Warblers at Mr. J. H. Price's ranch (Knowlton) on May 27, 1907.

167. *Dendroica aestiva*. YELLOW WARBLER.— Abundant summer visitor to both counties, arriving about the middle of May. Scarce in the pines. Nested all over my ranch near Terry in trees or bushes indifferently. Of four nests examined in the brush at our north window on June 22, 1893, two contained young birds. Their mothers showed many signs of distress, and performed antics in the bushes near to attract my attention. These nests were beautiful soft cups, of dried grass with wool and hair interwoven, placed in the forks of saplings. One nest enclosed a young choke cherry, and another small dead tree as well.

168. *Dendroica coronata*. MYRTLE WARBLER.— Tolerably common on the spring migration but usually met with in small numbers. A flock was seen on Whitney Creek (Custer County), associating with Yellow Warblers, on May 7, 1893. Another flock appeared at my ranch near Terry on May 2, 1894. I have noticed this warbler in the pine-hills and river valleys alike.

169. *Dendroica striata*. BLACK-POLL WARBLER.— Captain Thorne gives this bird as "Common in May." I have not observed it.

170. *Dendroica townsendi*. TOWNSEND'S WARBLER.— Rare. I saw the bird for the first time on May 18, 1894, when an adult male came to the north window of my ranch in Custer County. Like the Redstart it was strongly attracted by the flies inside the glass, and remained for a considerable time in the bushes and creepers which grew almost against it. I was thus enabled to watch the lovely warbler from within the room. On May 11, 1896, the same bird (or another) was again observed under exactly similar circumstances.

171. *Seiurus aurocapillus*. OVEN-BIRD.— Rare. Captain Thorne took a male on July 23, 1888. I have not seen it.

172. *Seiurus noveboracensis notabilis*. GRINNELL'S WATER-THRUSH.— Rare. Captain Thorne mentioned: "One juvenile taken Sept. 12, 1889." On May 24, 1905, I observed a single bird in cottonwoods along the Yellowstone at Mr. W. S. Haley's ranch in Custer County.

173. *Geothlypis trichas occidentalis*. WESTERN YELLOW-THROAT.— Dr. J. A. Allen found this species "More or less common along all the wooded streams, from the Missouri to the Musselshell, and quite abundant at favorable localities." Captain Thorne has a record of four examples in spring. I have not come across it.

174. *Icteria virens longicauda*. LONG-TAILED CHAT.— Common sum-

mer visitor along the rivers and creeks, arriving about May 25. Accidental in the pines. Breeds. During the pairing season the male is conspicuous in the tree tops and has a loud song of much sweetness although each passage ends in a croak. While nesting the birds become very retiring in their habits and are rarely seen. A nest found June 11, 1894, in a thicket of wild roses and gooseberry bushes, on the bank of the Yellowstone, contained three eggs of the Chat and one egg of a Cowbird. A Long-tailed Chat came to our north window on May 25, 1893, and endeavored to reach the flies through the glass. We therefore killed a number of blue bottles, which were threaded on a string and hung outside the window. The bird then performed a number of strange antics in order to release the flies, recalling the Old World Robin (*Erithacus rubecula*), both by its confiding manners and habit of looking at us with its head on one side.

The aerial evolutions of Long-tailed Chats during and after the nesting season are very remarkable. As I rode at my ranch (Custer County) on July 9, 1894, five Long-tailed Chats were crossing an extensive area of trees and brushwood below me. The first bird noticed I mistook for a detached leaf, but, on looking again, I saw the other birds, which ascended to a certain distance with a jerky, butterfly motion, then drifted aimlessly into the bushes like so many dead leaves.

175. *Wilsonia pusilla*. WILSON'S WARBLER.—Rare. Captain Thorne records: "One male May 19, 1889." I have not seen it.

176. *Setophaga ruticilla*. AMERICAN REDSTART.—Tolerably common summer visitor. Rare, or casual, in the pines. Undoubtedly breeds, although I have not happened to find a nest. A pair remained during the summer of 1907 on Mr. J. H. Price's ranch but search for the nest was made too late. Captain Thorne has taken young birds by July 24. On May 25, 1893, a female Redstart made persistent efforts to reach the flies inside my window through the glass at my ranch near Terry. The males appear to arrive before the females.

177. *Anthus pensilvanicus*. AMERICAN PIPIT.—Not common. Occasional spring and fall migrant in small flocks. Pipits are most often seen here about the end of April in the ploughed land, as they are fond of following the plough and seeking their food in the freshly turned up earth. They also alight on the wire fences. On the prairie in fall, Pipits associate with Horned Larks and Longspurs, when they can always be recognized by their buff underparts.

178. *Cinclus mexicanus*. AMERICAN DIPPER.—Rare. Mr. J. H. Price has observed this bird at different dates on Locate Creek in summer. I have no notes of the Dipper in Montana, although I have observed it on Tongue River, just across the line in Wyoming, where it breeds.

179. *Oroscoptes montanus*. SAGE THRASHER.—Rare. In his report to the Secretary of War on the Montana collections made in 1873, Dr. J. A. Allen mentions Sage Thrashers as seen at distant intervals on the divide between the Musselshell and Yellowstone.¹

¹ Notes on the Natural History of portions of Montana and Dakota. By J. A. Allen, Naturalist of the Expedition.

In his list of Birds of Fort Custer¹ Dr. Mearns gives the Sage Thrasher as "Common." Captain Thorne saw two on Tongue River in August, 1890, and secured one. Neither I nor any of my correspondents have met with this bird.

180. *Galeoscoptes carolinensis*. CATBIRD.—Common summer visitor along the rivers and creeks. Rare or casual in the pines. More nests of this species were to be found on my ranch near Terry than of any other bird.

181. *Toxostoma rufum*. BROWN THRASHER.—Common along the rivers of both counties; scarce in the pines. Dr. J. A. Allen found the Thrasher "more or less common everywhere in the thickets along the streams from the Missouri to the Musselshell."

This splendid songster arrives about the first week of May and begins to sing in the middle of the month. As far as my observations go the Thrasher is silent while the female is incubating, and, as she is usually sitting hard in the second week of June, the song can be heard only for a period of about three weeks. Thrashers nest in the wild plum and choke cherry thickets here, or in the willows along the banks of the Yellowstone. They bred regularly on my ranch in Custer County, and in June, 1894, there was a nest in the bushes at my north window. Four eggs are laid.

The Thrasher is the only singer in Eastern Montana which can vie with the Old World Thrush or Blackbird—even with *Philomela* herself, but for a harsh note produced after the most beautiful passages. Like the Nightingale, the Thrasher sings at night, when other birds are silent, as well as by day, although several species do so occasionally—notably the Meadowlark. As may be inferred from the above, the Thrasher has a powerful and melodious voice, which is equally entrancing when heard from the topmost branches of a pine or from the lowest depths of some tangled copse. Although considered as only an aberrant Thrush by ornithologists the Thrasher's song cannot fail to remind the pilgrim of the Song Thrush (*Turdus musicus*), which, according to Dixon, is the finest of British feathered musicians.² Comparisons are frequently made between the song of the Old World Thrush and that of the Nightingale and I have referred the point to my brother who has had considerable opportunities for hearing both. He says: "The Song Thrush is frequently heard in full song after sun-down, and in the stillness of night this song is frequently mistaken for that of the Nightingale by those who have heard both. Obviously, therefore, the two may be compared. On the other hand, if the two birds be heard *simultaneously*, no possible mistake can be made as to which is Thrush and which Nightingale, and, in my opinion, no comparison seems reasonable at such a moment. We yield at once to the magic spell of 'the thrilling song which has been the theme of poets of all ages.' When at Trinity College, Oxford, in the seventies, I had the good

¹ Condor, Vol. VI, 1904, p. 21

² See as quoted in 'British Birds' by Henry Seebohm, Vol. I, p. 216.

fortune to occupy rooms looking out upon the beautiful gardens, and happened frequently to be awake at dawn. In the summer term the birds which thronged in the gardens were heard to the greatest advantage shortly after sunrise, and I used to take pleasure in discriminating the various notes of the feathered instrumentalists in this bird symphony. As a rule, the orchestra was in full swing when the Nightingale entered the 'partition' and I can truthfully affirm that he dominated the melodious sea of bird-tone just as effectually as three trombones can and do dominate all the strings of Wagner's immense orchestra. I have no desire to imply that the Nightingale resembles the trombones except in the patent fact that once he 'chips in' upon the other birds — as many thrushes as you please — you've got to listen to *him* or shut your window."

182. *Salpinctes obsoletus*. ROCK WREN.—Summer visitor to both counties. Abundant in the badlands, and on ranches near them replaces the House Wren about buildings. Like the latter, the bird is exceedingly tame and confiding and so falls an easy victim to predatory animals. On August 23, 1906, I interfered to save a Rock Wren from the clutches of a Sparrow Hawk which stooped at it just below my window where I sat writing. Rock Wrens arrive about May 15, and begin nesting soon after. They excavate any small hole selected in a steep cut bank or butte, to a depth of six inches, in which a nest is made of dried grass or weeds which may grow near. One nest was constructed almost entirely of a brittle weed which grows in the badlands. Six, seven, or eight eggs are laid. July 3 is the earliest date on which I have seen full feathered young, but nestlings may be fledged any time between this and the beginning of August. At first their plumage is slate-colored above, showing traces of cinnamon, head brown, entire underparts buff, legs pink, but in about a month approximates to that of the parents. Both the latter feed the nestlings assiduously, chiefly on grasshoppers and green caterpillars. Owing to their habit of choosing holes under the overhanging edges of washouts, the nests of Rock Wrens are exposed to annihilation from the frequent land slides. I know of one nest, containing seven eggs, which was thus engulfed, when the sitting bird must have perished, and perhaps her mate as well.

183. *Thryothorus ludovicianus*. CAROLINA WREN.—Rare. Of this bird Captain Thorne writes: "Two in May on the divide between Powder and Tongue Rivers. One in May and two in August at Lame Deer, Montana." I have not seen it.

184. *Troglodytes ædon aztecus*. WESTERN HOUSE WREN.—Common summer resident. Nests in all kinds of places, but usually in the holes of trees along the rivers and creeks. Replaced by the Rock Wren in rough pine hills or badlands. An occasional wanderer to my water-troughs in Dawson County. In June, 1893, at my ranch (Custer County) one pair of wrens nested in a hole in a box elder, while another pair occupied the shelf inside an outbuilding. In the latter case the birds made an immense barricade of sticks and the young were full fledged on July 31. On July 1,

1905, near Knowlton, a pair of Wrens were feeding their nestlings in the deep fissure of an uprooted pine which had fallen across a spring. A mass of twigs and bullberry thorns had been placed to protect the nest where the crack was widest. I have found the female wren utterly fearless; she would feed her young continually despite my presence.

185. *Sitta carolinensis aculeata*. SLENDER-BILLED NUTHATCH.—Not common. Dr. J. A. Allen mentions this bird as "observed at rare intervals, both on the Yellowstone and Musselshell." Captain Thorn "saw six and took two at Lame Deer, Montana." I have only seen these Nuthatches in the Missouri Brakes, and among the pines around Knowlton where they breed. On July 1, 1905, I observed two old birds with four young come to drink from the water-troughs at the old saw-mill on Horse Creek. They were in company with Crossbills and Goldfinches.

186. *Parus atricapillus septentrionalis*. LONG-TAILED CHICKADEE.—Common resident in both counties. Nests in small deep holes of high dead pines. On June 15, 1903, a pair of Chickadees were seen to be greatly excited over a strip of rag hung in a pine on Cottonwood Creek, Dawson County. They hovered about it, meditating an attack, but with each breath of wind the flag fluttered, and frightened away the birds which returned when the wind ceased. This strange behavior on their part induced me to investigate, when I found their nest of wool, hair, and grass in a very small hole below the rag. Four full feathered young were visible, and there may have been more in the background. The birds' fears were entirely allayed when I wrapped the offending rag around the branch. Chickadees are among the tamest birds here, and were welcome visitors to all my hunting camps.

187. *Myadestes townsendii*. TOWNSEND'S SOLITAIRE.—Winter resident; not common. Arrives second week in September and leaves middle of April. I first noticed these birds on Snow Creek, in the Missouri Brakes, when they were frequently seen among the pines during October and November. Another pair were observed on Oct. 8, 1899, in the pines of the divide above the badlands opposite Terry, on the north side of the Yellowstone. I have not seen Townsend's Solitaire on the south side of the river. A pair frequented my ranch in Dawson County during November, 1904, and throughout October and November in 1905. On Nov. 25, these were joined by two others when all four seemed to live near the water troughs and playfully chased each other round and round the cedars. They were not seen after a blizzard on Nov. 28, when the temperature fell to 14° below zero, but they are able to withstand severe cold, as a pair returned at the end of January and remained until April 14. During winter they subsist on cedar berries. On Sept. 9, 1906, a Townsend's Solitaire perched on a trough into which I was pumping water.

188. *Hylocichla aliciae*. GRAY-CHEEKED THRUSH.—Rare. A solitary individual came to my water-troughs (Dawson County) on May 13, 1904. Captain Thorne records "one female, May, 1889."

189. *Hylocichla ustulata swainsoni*. OLIVE-BACKED THRUSH.—Not

common. A regular spring migrant in both counties but seldom seen in the fall. I have not seen more than two at one time, excepting on May 31, 1906, when I counted six together.

190. *Merula migratoria propinqua*. WESTERN ROBIN.—Common summer resident. Arrives about the second week in April. Several pairs nested annually on my ranch near Terry, and one or two pairs in the pine hills at my Dawson County ranch. In 1907, a pair of Robins nested in a shed at Mr. J. H. Price's ranch near Knowlton. The young were hatched on June 22, and were flying about on July 28. In May, when about ranches, the Robin chooses some elevated position, such as the brace of high gate posts, or the cable of a haycarrier, and pours forth its song for half an hour at a time. Although the latter only consists of two notes frequently repeated (*chirrup, chirrup, chirrup*, etc.), it is nevertheless a persistent and extremely pleasing effort. In the fall Robins, old and young, flock together in the pines. A species of red currant (called spice-berry here) ripens about the end of August and proves a great attraction to them. These plants grew around my water-troughs (Dawson County); on August 27, 1904, I watched upwards of seventy Robins which were drinking and feeding on the berries. Six birds could be seen perched on a single bush. The Robins constantly uttered a loud clucking similar to the Old World Blackbird (*Turdus merula*) but I never heard them sing. They remain in the pines until about October 22, when all leave for the south.

191. *Sialia arctica*. MOUNTAIN BLUEBIRD.—Bluebirds are among the earliest spring arrivals here, and may be seen as early as March 20. They are not common in either county except on the spring and fall migrations, when they pass in flocks containing from twenty to thirty birds. A few pairs remain to nest in the pine hills, choosing any convenient cavity in a dead tree.

During June, 1903, a pair of Bluebirds took possession of a deserted Cliff Swallow's nest near the summit of a perpendicular sand rock at my ranch in Dawson County.

ADDENDA.

192. *Nyctala acadica*. SAW-WHET OWL.—Rare. To the best of my knowledge this owl has not before been recorded from Montana. On July 12, 1907, Mr. M. M. Archdale was driving a cattle herd on his ranch near Knowlton when he caught sight of this owl, which had been disturbed by the animals, at the edge of a thicket. Feeling certain that here was a new bird for this locality he most kindly sent his brother post-haste for me while keeping watch on the owl himself until I arrived. It proved to be a bird of the year, and was probably bred in the neighborhood. Other members of the family, from their nocturnal habit, might easily have escaped notice. I watched the owl for a long time. It evidently had a great dislike to the daylight, flitting about, when disturbed, in the depths of the plum and

choke cherry brush where my wife had followed it with a camera giving exposures up to twenty seconds. As soon as she desisted the owl immediately closed its eyes, although its short flights were made with swiftness and vigor.

It appeared to prefer perching at heights of three or four feet from the ground, and refused to stay in the tall box-elders of which there were several in the grove. A shrew-mouse on a branch near the owl had obviously been killed by it. As seen at a distance of eight feet this bird's appearance was as follows.

Upper parts uniform chocolate brown, wings and tail darker; facial disc black, in strong contrast to broad white circles above the eyes, the white including the forehead. Upper breast the color of back, becoming abruptly fulvous on the underparts and giving the impression that beneath the bird is half brown and half buff. Primaries spotted with white. Feet and legs pale buff, bill black, irides orange. Length about seven inches.

77. *Asio wilsonianus*. On May 7, 1907, when walking with Mr. Dan Bowman at his ranch near Knowlton, we saw a Long-eared Owl lying dead upon her six eggs in a deserted crow's nest. We concluded that she died from eating a poisoned bait.

79. *Megascops asio maxwelliæ*. Four, two old, and two young which could scarcely fly, were seen by Bert Bowman at his father's saw-mill on Horse Creek, Custer County, in July, 1897. He again noticed four on the south fork of Sheep Creek, Custer County, in July, 1905.

SUMMER BIRDS OF THE GREEN MOUNTAIN REGION OF SOUTHERN VERMONT.¹

BY FRANCIS H. ALLEN.

So little has been published concerning the distribution of birds in Vermont that I have thought my observations conducted in the breeding-season in the years 1886, 1895, and 1907 in the southern part of the State might be of some interest. These observations were confined to periods of about a fortnight each at a time when practically all birds were settled for the season, and they thus show, so far as they go, the breeding population. In 1886 I spent the time from July 5 to July 19 at Londonderry, in Windham County,

¹ Read before the Nuttall Ornithological Club, Oct. 21, 1907.

and again in 1895 I visited the same place from June 17 to July 1. In 1907 I conducted my observations in the neighborhood of West Bridgewater, in Windsor County, from June 18 to June 29.

Londonderry is in Lat. $43^{\circ} 13'$, in the valley of the West River, about midway between the New Hampshire and New York lines. The altitude of the principal village, South Londonderry, is 1020 feet; that of the North Village, three miles farther up the river, is 1100 feet. The house where I spent my nights is on the brow of a hill on the east side of the town and is about 1450 feet above the sea. The country is smooth and comparatively fertile. The main Green Mountain range, on the west side of the valley, reaches its culmination for this region in Stratton Mountain (3859 feet), said to be the highest mountain in Vermont south of Killington Peak. On the east side, Glebe Mountain, or the Glebe, is the highest, with an altitude of 2944 feet. These mountains were in 1886 and 1895 — I am uninformed as to present conditions — almost entirely covered with forest, mostly well advanced second growth but with more or less of the original. They are graceful in shape, with flowing outlines, and present little of the rugged in appearance. The West River is a swift, shallow stream, of only moderate width, except above the milldams. There are considerable stretches of intervale in places along its banks.

The woods of this region were mostly yellow birch, hemlock, red spruce, balsam fir, and sugar maple. White pines were only fairly common. The deciduous trees and mixed growth extended well up the mountainsides, even to the summit of the Glebe. The character of the country was sufficiently diversified to attract a respectable variety of birds.

West Bridgewater, the centre of my operations in 1907 (June 18–29), is a little hamlet situated in the narrow valley of the Ottaquechee River in the heart of the Green Mountains, in Lat. $43^{\circ} 36'$ and nearly due north of Londonderry. It is at the extreme west of the township of Bridgewater and also of Windsor County, a considerable part of the village being in Sherburne, Rutland County, in fact. Three other towns corner near by,—Mendon, Shrewsbury, and Plymouth. The altitude of the river-bottom at this point is about 1100 feet, and the mountains rise steeply above it, covered entirely with forest except for a few hill farms on some of

their lower ridges. The brook from the reservoir pond in Plymouth enters the river near the post-office, and its valley forms with the river-valley a kind of Y. The intervalles are too restricted to admit of extensive grass-fields, so that the birds of the open are not very numerous and of so common a bird as the Vesper Sparrow I found but a single individual. Woods birds, on the other hand, are abundant enough.

The western wall of the valley is formed by the main range of the Green Mountains. Killington Peak (4241 feet), the highest mountain in southern Vermont, is due west of the village, the summit at a distance of about three miles in an air line and about five miles by trail. Pico Peak (3967 feet) is a little farther north. Several other peaks in the neighborhood ascend beyond 3500 feet. On the other side of the Ottaquechee River is the long ridge of East Mountain, which rises to the height of 2812 feet.

In the valley and well up the mountainsides hardwood trees and mixed growth predominate, except in overgrown pastures, where young spruces and firs are the principal trees. On the upper slopes red spruce forms the bulk of the forest, and the summits of Killington and Pico Peaks are covered with a scrub growth of balsam fir, except that the very top of Killington is bare ledge. The deciduous woods are composed chiefly of sugar maple, yellow birch, beech, and paper birch. Scattered trees of red oak are not uncommon on the lower levels. Hemlock is common, but I saw no pine of any kind in the immediate neighborhood.

The Ottaquechee River is swift and shallow here for the most part, though there are several natural deadwaters in the town of Sherburne, one of which, at least, has marshy banks which harbor a few Swamp Sparrows as well as Red-winged Blackbirds and Savanna Sparrows.

The faunal relations of New England birds are so well understood that no general remarks as to the local distribution of the species are necessary here, and I proceed at once to the list. (It should be noted that this list cannot pretend to completeness even within its narrow limits. There are certainly omissions among the larger and more seclusive birds such as hawks and owls, but it probably gives a sufficient indication of the general character of the summer ornithology of this region.)

LIST OF SUMMER BIRDS OBSERVED IN THE GREEN MOUNTAIN
REGION OF SOUTHERN VERMONT.

Note.—L. is used for Londonderry, W. B. for West Bridgewater.

1. *Butorides virescens*. GREEN HERON.—Not uncommon in L. in 1886. Not seen there in 1895 nor at W. B.
 2. *Philohela minor*. AMERICAN WOODCOCK.—One observed in Sherburne, June 21, 1907, at an altitude of 1800 or 1900 feet.
 3. *Bartramia longicauda*. BARTRAMIAN SANDPIPER.—A pair observed in L., 1895. They evidently had a nest or young near by, to judge by their actions.
 4. *Actitis macularia*. SPOTTED SANDPIPER.—One or two observed at L., 1895; none seen there, 1886. Quite common at W. B.
 5. *Colinus virginianus*. BOB-WHITE.—One heard at L., June 30, 1895, all through the day, in fields and bushy pastures near the house where I stayed. This is probably about the northern limit of the natural distribution of this species in Vermont. I cannot, however, be positive that this was not an introduced bird, though I think it doubtful if any Quail have, or had at that time, been introduced in that neighborhood.
 6. *Bonasa umbellus subsp.* RUFFED GROUSE.—Not uncommon. One old bird with young at W. B. was seen to be very gray and was doubtless of the subspecies *togata*, as are probably most or all of the birds in this region.
 7. *Buteo borealis*. RED-TAILED HAWK.—Two observed at L., 1895; no hawks identified there in 1886. Three at W. B.
 8. *Buteo platypterus*. BROAD-WINGED HAWK.—One observed several times at L., 1895.
 9. *Falco peregrinus anatum*. DUCK HAWK.—One seen at W. B. flying up the brook-valley one afternoon. Mr. G. H. Ross in his 'List of Birds observed in Rutland County' (Vermont Bird Club, Bulletin No. 1, 1906, p. 9) says this species has bred at Wallingford, which is about fifteen miles southwest of W. B.
 10. *Syrnium varium*. BARRED OWL.—One heard at L., 1895. I heard no owls at W. B., though I took a number of evening walks for the express purpose of listening for them. From what the inhabitants told me I concluded that the Barred, Great Horned, and Screech Owls were all found there.
 11. *Coccyzus erythrophthalmus*. BLACK-BILLED CUCKOO.—Rather common.
 12. *Ceryle alcyon*. BELTED KINGFISHER.—Rather common.
 13. *Dryobates villosus*. HAIRY WOODPECKER.—Not uncommon.
 14. *Dryobates pubescens medianus*. DOWNY WOODPECKER.—Rather common.
- [*Picoides arcticus*. ARCTIC THREE-TOED WOODPECKER.—Prof. G. H. Perkins in his 'Preliminary List of the Birds found in Vermont' (New York

and Albany, 1901) says that Mr. G. H. Ross of Rutland has found this species nesting in Sherburne; and Mr. Ross, in his 'List of Birds observed in Rutland County,' says, "One nesting record, Pico Peak, Sherburne."]

[*Picoides americanus*. AMERICAN THREE-TOED WOODPECKER.— Mr. R. H. Howe, Jr.'s, Review of Perkins's List (Contributions to N. A. Ornithology, II, 5-23, 1902) gives this bird as a summer resident on Pico Peak above 2500 feet on the authority of Mr. Ross. Mr. Ross, in his own List (*op. cit.*), merely says, "Have seen it in summer on Pico Peak." Probably neither of the Three-toed Woodpeckers is at all common in this region. In two ascents of Killington Peak and one of Pico I saw none.]

15. *Sphyrapicus varius*. YELLOW-BELLIED SAPSUCKER.— Pretty common; probably the commonest woodpecker of the region.

[*Geophlœus pileatus abieticola*. NORTHERN PILEATED WOODPECKER.— I think I saw one of these birds at L. in 1895, and I found peck-holes of the species at W. B., though none that were very fresh. It should probably be classed as a rare resident in this region.]

16. *Colaptes auratus luteus*. NORTHERN FLICKER.— Rather common at L. Only two observed at W. B.

17. *Chordeiles virginianus*. NIGHTHAWK.— Rather common at L. None observed at W. B., though I found them common at Woodstock, a dozen miles to the east.

18. *Chætura pelagica*. CHIMNEY SWIFT.— Abundant.

19. *Trochilus colubris*. RUBY-THROATED HUMMINGBIRD.— Two at L., 1886; none there in 1895. Five at W. B.

20. *Tyrannus tyrannus*. KINGBIRD.— Rather common at L. Not very common at W. B.

21. *Myiarchus crinitus*. CRESTED FLYCATCHER.— Not very common at either locality. I found a pair at an altitude of about 2000 feet in the town of Sherburne, in a lumberman's clearing in the woods. I also observed two other individuals in different localities in the neighborhood of W. B.

22. *Sayornis phœbe*. PHŒBE.— Common.

23. *Nuttallornis borealis*. OLIVE-SIDED FLYCATCHER.— Rather common.

24. *Contopus virens*. WOOD PEWEE.— Common.

25. *Empidonax flaviventris*. YELLOW-BELLIED FLYCATCHER.— Not common. A few observed at L., 1895; none identified at W. B.

26. *Empidonax traillii alorum*. ALDER FLYCATCHER.— Uncommon at L. Rather common at W. B.

27. *Empidonax minimus*. LEAST FLYCATCHER.— Rather common at L. Common at W. B.

28. *Cyanocitta cristata*. BLUE JAY.— Rather common.

29. *Corvus brachyrhynchos*. AMERICAN CROW.— Common at L.; less so at W. B.

30. *Dolichonyx oryzivorus*. BOBOLINK.— Common at L.; less so at W. B. on account of scarcity of good breeding-places.

31. *Agelaius phoeniceus*. RED-WINGED BLACKBIRD.— Rather common.

32. *Icterus galbula*. BALTIMORE ORIOLE.—Two observed in South Londonderry village, 1895. None found at W. B., though a few were noted at Woodstock on my way there.

33. *Carpodacus purpureus*. PURPLE FINCH.—Common.

34. *Loxia curvirostra minor*. AMERICAN CROSSBILL.—A flock of fifteen or twenty seen twice, and small detachments or individuals several times, at L., 1895.

35. *Astragalinus tristis*. AMERICAN GOLDFINCH.—Pretty common at L. Abundant at W. B.

36. *Spinus pinus*. PINE SISKIN.—Three seen at W. B.

37. *Poecetes gramineus*. VESPER SPARROW.—Common at L. Only one observed at W. B., where extensive upland grass-fields were few.

38. *Passerculus sandwichensis savanna*. SAVANNA SPARROW.—Common in both localities.

39. *Zonotrichia albicollis*. WHITE-THROATED SPARROW.—Common at higher levels. Found as low as 1800 feet at W. B. It came still lower at L., but I have no record of the precise altitude.

40. *Spizella socialis*. CHIPPING SPARROW.—Common.

41. *Spizella pusilla*. FIELD SPARROW.—Rather common at L. Only two observed at W. B.

42. *Junco hyemalis*. SLATE-COLORED JUNCO.—Common at higher levels. Found among spruces as low as 1200 feet at W. B. A few were also seen in the valley at L.

43. *Melospiza cinerea melodia*. SONG SPARROW.—Common.

44. *Melospiza georgiana*. SWAMP SPARROW.—Not very common, doubtless because suitable breeding-places are not numerous or extensive. One observed at L., 1886; three or four there, 1895; three males singing in Sherburne.

45. *Zamelodia ludoviciana*. ROSE-BREASTED GROSBEEK.—Not uncommon at L., 1886; none observed there in 1895. Rather common at W. B.

46. *Cyanospiza cyanea*. INDIGO BUNTING.—Common at L. Rather common at W. B.

47. *Piranga erythromelas*. SCARLET TANAGER.—I found none at L. in 1886, but they were rather common there in 1895. At W. B. I found them not uncommon.

48. *Petrochelidon lunifrons*. CLIFF SWALLOW.—Common.

49. *Hirundo erythrogaster*. BARN SWALLOW.—Abundant.

50. *Riparia riparia*. BANK SWALLOW.—Not uncommon at L., 1886, but not identified there in 1895. Abundant at W. B.

51. *Ampelis cedrorum*. CEDAR WAXWING.—Common.

52. *Vireo olivaceus*. RED-EYED VIREO.—Abundant.

53. *Vireo gilvus*. WARBLING VIREO. Four heard in the village streets in L. in 1895.

54. *Vireo solitarius*. BLUE-HEADED VIREO.—Not very common.

55. *Mniotilta varia*. BLACK AND WHITE WARBLER.—Rather common at W. B. and in 1895 at L., but not observed at L. in 1886.

56. *Helminthophila rubricapilla*. NASHVILLE WARBLER.— I noted but a single individual at L. in 1886, but found the bird abundant there in 1895. Common at W. B. Perhaps this and the preceding species were commoner at L. in 1886 than indicated, and had merely suspended singing.

57. *Compsothlypis americana usneæ*. NORTHERN PARULA WARBLER.— Rather common.

58. *Dendroica cærulescens*. BLACK-THROATED BLUE WARBLER.— Rather common at L. Common at W. B.

59. *Dendroica coronata*. MYRTLE WARBLER.— A few observed on the higher levels at L. Pretty common at W. B. A bird of the spruce growth.

60. *Dendroica maculosa*. MAGNOLIA WARBLER.— Abundant at L. and the commonest warbler there. Common at W. B. Haunts the sparse spruces and firs of overgrown pastures.

61. *Dendroica pensylvanica*. CHESTNUT-SIDED WARBLER.— Common at L. Abundant at W. B.

62. *Dendroica striata*. BLACK-POLL WARBLER.— One heard singing on summit of Stratton Mountain, June 29, 1895, at an altitude of about 3800 feet (Auk, XIII, 1896, 345). Abundant on and near summits of Killington and Pico Peaks and found down to about 3200 feet.

63. *Dendroica blackburniæ*. BLACKBURNIAN WARBLER.— Common.

64. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.— Rather common.

65. *Seiurus aurocapillus*. OVEN-BIRD.— Common at L. Rather common at W. B.

66. *Geothlypis philadelphia*. MOURNING WARBLER.— One heard singing June 28 and 30, 1895, at L. Four singing males found at W. B. One of the latter uttered a number of times in my hearing a call or alarm note which may be worth recording here as it is not described in Mr. Chapman's 'Warblers of North America.' It was a sharp, rough *chip*, difficult of description but quite distinct from any other bird-note with which I am familiar.

67. *Geothlypis trichas brachidactyla*. NORTHERN YELLOW-THROAT.— Common.

68. *Wilsonia canadensis*. CANADIAN WARBLER.— Not common at L.; two observed there in 1895. Abundant at W. B. I think I have never elsewhere found this species so abundant as in the neighborhood of West Bridgewater.

69. *Setophaga ruticilla*. AMERICAN REDSTART. Rather common at L. Common at W. B.

70. *Galeoscoptes carolinensis*. CATBIRD.— Not common at L. Rather common at W. B.

71. *Toxostoma rufum*. BROWN THRASHER.— Three or four observed at L. in 1895. None at W. B.

72. *Troglodytes ædon*. HOUSE WREN.— Not common. I found none at L. in 1895 and none at W. B.

73. *Olbiorchilus hiemalis*. WINTER WREN.—Rather common at L. At W. B. I found it positively abundant on the higher levels and occasional as low as 1200 or 1300 feet.

74. *Certhia familiaris americana*. BROWN CREEPER.—Rather common on the higher levels.

75. *Sitta carolinensis*. WHITE-BREASTED NUTHATCH.—Not very common.

76. *Sitta canadensis*. RED-BREASTED NUTHATCH.—Rather common at L. Unexpectedly uncommon at W. B.; only three observed there.

77. *Parus atricapillus*. CHICKADEE.—Common.

78. *Parus hudsonicus*. HUDSONIAN CHICKADEE.—Two observed June 29, 1895, on summit of Stratton Mountain at an altitude of about 3800 feet (Auk, XIII, 1896, 345). I fully expected to find the bird on Killington Peak but on my two ascents of the mountain I was disappointed.

79. *Regulus satrapa*. GOLDEN-CROWNED KINGLET.—Rather common on the higher levels at L. Commoner at W. B.

80. *Hylocichla mustelina*. WOOD THRUSH.—I was surprised to find the Wood Thrush a fairly common bird in the neighborhood of West Bridgewater. I heard nine individuals, eight of which were singing. The ninth was heard calling near the top of the mountain on the eastern side of the Plymouth Pond brook, at an elevation of probably 2000 or 2500 feet. The others were at lower altitudes and chiefly at the foot of the mountains. Their songs could be heard from the road together with the songs of Wilson's, Olive-backed, and Hermit Thrushes. The first one I heard was on my way back from Killington Peak, where I had found the Bicknell's Thrushes in full song, so that I heard that day all five of our New England thrushes singing on their breeding-grounds,—an experience which I had enjoyed only once before, at Chocorua, N. H. I believe that the Wood Thrush is extending its range in northern New England, and it is not unlikely that it may now be found at Londonderry, but I am certain that as recently as 1895 it was absent or at any rate rare in that locality. It also breeds farther north in Vermont. Mr. A. H. Howell found it at the base of Mt. Mansfield in 1899 (Auk, XVIII, 1901, 345), and I found four or five individuals singing at Willoughby Lake in June, 1896. Mr. Bradford Torrey has also reported the bird from Lake Memphremagog, though from the Canadian side of the border ('Birds in the Bush,' Boston, 1885). The occurrence of the bird in the Province of Quebec, by the way, is not noted by Mr. Ridgway in 'The Birds of North and Middle America, Part IV.'

81. *Hylocichla fuscescens*. WILSON'S THRUSH.—Pretty common at L. Abundant at W. B. Confined to the lower levels.

82. *Hylocichla aliciae bicknelli*. Common on and near the summit of Killington Peak and descending to 3200 feet. Mr. R. H. Howe, Jr.,—on the authority of Mr. G. H. Ross, as he writes me,—gives it to Pico Peak as well as Killington. My failure to find it there on June 25 was very likely due to the fact that the birds were not active at the time, the day being a

very warm one and my stay on the summit of short duration. On my second ascent of Killington Peak on June 28 I heard only one or two singing, though a week earlier I had heard as many as eight. Mr. Howe says it "undoubtedly breeds on Mt. Annanance and other peaks over 3,000 feet." I am confident that it breeds on Annanance, for I saw there on June 30, 1896, a thrush with a loud squealing note which was unknown to me at the time but which I have since learned to be one of the Bicknell's notes. I think it very doubtful, however, if it is to be found on *all* peaks over 3000 feet, at least in the southern part of the State, though it may *descend* to that level on mountains of a greater altitude, spreading down from the scrub firs and spruces which are its normal habitat into the larger growth of the mountainsides.

83. *Hylocichla ustulata swainsoni*. OLIVE-BACKED THRUSH.—Rather common at L. Abundant at W. B. Commonest on the higher levels but descending well down the mountainsides.

84. *Hylocichla guttata pallasii*. HERMIT THRUSH.—Abundant in both localities, except that in 1895 this species had suffered decimation from the severe frosts of the preceding winter in the South, so that I found at L. that year but seven individuals singing (probably representing as many pairs).

85. *Merula migratoria*. AMERICAN ROBIN.—Abundant.

86. *Sialia sialis*. BLUEBIRD.—Common at L., 1886; absent in 1895, owing to the disastrous frosts of the preceding winter. Rather common at W. B.

The absence of the Bay-breasted Warbler (*Dendroica castanea*) from the foregoing list will perhaps be a matter of surprise to ornithologists who have found it comparatively common in the White Mountains of New Hampshire. I was constantly on the lookout for the bird at West Bridge-water, especially among the spruce growth of the higher altitudes, just below the Black-poll's haunts, where I confidently expected to find it, but though I am very familiar with its song and should certainly have noted it had the bird been present and singing, I was unsuccessful. Neither did I find the species at Willoughby Lake, Vt., where I spent the fortnight from June 17 to July 1, 1896. It is also absent from Mr. A. H. Howell's admirable list of the 'Summer Birds of Mount Mansfield, Vermont' (Auk, XVIII, 1901, 337-347). Professor Perkins calls it simply a migrant, and Mr. Howe (*op. cit.*) says, "Reported at Townshend summer, 1901, though not actually found breeding, Evans." It seems improbable therefore that the Bay-breasted Warbler can be anything like as common a breeder in the Green Mountains as it is in the White Mountains.

ON THE STATUS OF BREWSTER'S WARBLER (*HELMINTHOPHILA LEUCOBONCHIALIS*).¹

BY CHARLES W. TOWNSEND, M. D.

DR. LOUIS B. BISHOP, in a paper read at the twenty-second Congress of the American Ornithologists' Union, reached the conclusion by means of an admirable series of specimens, that while Lawrence's Warbler (*Helminthophila lawrencei*) is a hybrid between the Golden-winged Warbler (*H. chrysoptera*) and the Blue-winged Warbler (*H. pinus*), Brewster's Warbler (*H. leucobonchialis*), on the other hand "is merely a leucochroic phase of *H. pinus*."²

In observing the Brewster's Warbler in the Arnold Arboretum at Boston, reported by Miss Granger in these pages,³ I was impressed by two things. In the first place the bird had the Golden-wing patches possessed by *chrysoptera* and not by *pinus*, and secondly the bird sang exactly like *chrysoptera* and not like *pinus*. These facts are certainly suggestive of a relationship between Brewster's Warbler and the Golden-winged Warbler.

Three specimens that have come under my observation are worth describing in this connection:

No. 1. A female warbler, No. 1258 in my collection, in worn plumage taken by me at Ipswich on July 17, 1907. At first sight the throat of this specimen appears to be white, but on closer scrutiny the throat, breast, and sides of the abdomen are seen to be slightly gray, and to contrast faintly with the white center of the abdomen and sides of the neck. The cheek patches are dark gray. On each wing are two narrow wing-bars, pale yellow in color. In the median line of the breast are three new, partly grown yellow feathers. This bird was feeding a young with a black throat, Col. C. W. T. No. 1259, a normal young male Golden-winged Warbler.

No. 2. A specimen kindly lent me by Mr. Wm. Brewster from

¹ Read at a Meeting of the Nuttall Ornithological Club at Cambridge, December 2, 1907.

² Auk, Vol. XXII, 1905, p. 24.

³ Auk, Vol. XXIV, 1907, p. 343.

his collection, No. 48753, a female taken at West Point, N. Y., on May 26, 1901. This bird shows a clear white throat, a suspicion of a black line before and behind the eye, and faint grayish cheek patches. The wing patch is partially divided into two and yellow in color.

No. 3. A specimen kindly lent by Dr. J. A. Allen from the American Museum of Natural History, where I had noticed it in looking over the collection. This is a female, No. 54385, from Greenville County, South Carolina, with the plumage of a typical female Golden-winged Warbler, except that the left half of the throat is pure white. The right-half, the border line of which is clean cut and in the mid-line, is dark gray. The lower part of the throat on both sides is also gray, so that there is a right angle triangle in the throat that is white instead of dark gray. The cheek and wing patches are as in the normal female Golden-winged Warbler.

The first of these specimens might be dismissed as a much worn and faded female Golden-winged Warbler, except that the yellow breast feathers suggest Blue-winged blood, and the third as a case of partial albinism in an otherwise normal Golden-winged Warbler, but the second could not be so summarily disposed of. It is plainly a Brewster's Warbler, but the grayish ear patches are significant of Golden-winged blood. Taking all three specimens together it seems to me logical to conclude that we have here indications of links between the Golden-winged and Brewster's Warblers, a conclusion directly opposed to that of Dr. Bishop who found relationship between Brewster's and the Blue-winged Warblers only. If we had these specimens only, and pure white-throated Brewster's Warblers, we might conclude that the latter Warbler was merely a phase of the Golden-winged, but, as Bishop has shown, there are all degrees from a slight tinge of yellow on the breast of these otherwise white-throated specimens up to the complete yellow-throated Blue-winged Warbler.

Two explanations of the status of Brewster's Warbler would seem possible, both of which are worth discussion:

(1) That Brewster's Warbler is a hybrid between the Golden-winged and the Blue-winged Warblers.

(2) That Brewster's Warbler is a phase of the Golden-Winged

Warbler, between which and the Blue-winged Warbler there is a complete series of intergrades.

(1) Although it has been objected that it would be impossible to obtain a white-throated bird (*leucobronchialis*) from the interbreeding of a black-throated (*chrysoptera*) and a yellow-throated bird (*pinus*), yet I believe this is not the case, for in hybridization secondary or less dominant characteristics may become latent.

(2) The black throat of the Golden-winged Warbler is evidently a secondary or late development, at first confined to the male. The lesser development in the female, or its almost complete absence as in specimen *No. 1* would point in this direction, as female birds are as a rule more ancestral or generalized in their type. Specimen *No. 2*, although still retaining the ear patches very faintly, shows a more complete reversion to the ancestral type, although the suspicion of a black ocular line may be taken to mean Blue-winged blood. An ocular line seems to be, however, a more primitive decoration than the broader cheek patch of the Golden-winged Warbler. Specimen *No. 3* looked at from this point of view shows a slight tendency to reversion, as half of the throat has remained white.

In the Redstart (*Setophaga ruticilla*) the very striking jet black throat is attained by the male only, and that too not till the beginning of the second year. The female and the young male both have the simpler and more primitive light colored throat. If we could go back into the family history of this species, we should doubtless find an ancestor where the male, instead of sporting the brilliant flame and jet of the present bird, lived all his life a comparatively dull colored bird devoid of the black throat. It is conceivable, although it can not be proved, that even at the present day some male Redstarts live all their lives in the undeveloped or ancestral white-throated stage. To make the analogy with specimen *No. 3* still closer, it has only to be pointed out that young male Redstarts sometimes show patches of the black on one side only, before they attain their full development. A yearling male Redstart in my collection (*No. 638*) taken at Stoneham, Mass., on May 30, 1884, has a black patch three quarters of an inch long and one eighth to one fourth inch wide, confined to the left side of the breast. On the right side a suspicion of black is shown

by one or two feathers only. This, therefore, is comparable to the condition in specimen *No. 3* which shows black on one side only of the throat.

In the Golden-winged Warbler the early white-throated stage has, on this theory, been skipped in the normal bird, for the young have the dark throats of their parents. Brewster's Warbler with its white throat would then be an instance where the hypothetical ancestral stage has not been skipped. It is possible that some of these white-throated birds, if allowed to live, might ultimately develop black throats.

I wish here to express my indebtedness to Dr. Walter Faxon for assistance in the elaboration of this paper, and I would draw the following conclusions:

That Brewster's Warbler is *not* a leucochroic phase of the Blue-winged Warbler, but that it is either (1) a hybrid between the Golden-winged and the Blue-winged Warblers, or (2) that, in the white-throated form, it is a phase, ancestral in character, of the Golden-winged Warbler, and that there is a complete series of intergrades between this and the Blue-winged Warbler.

BIRD RECORDS FROM GREAT SLAVE LAKE REGION.

A PRELIMINARY LIST OF BIRDS OBSERVED BY MY 1907 EXPEDITION
INTO THE ARCTIC BARREN-GROUNDS OF CANADA.¹

BY ERNEST THOMPSON SETON.

COMMON LOON. *Gavia imber*. Common throughout the whole region from Fort Resolution to Back's River. Especially so on all the northern lakes. This and all the Loons stay until frost drives them out in October.

YELLOW-BILLED LOON. *Gavia adamsii*. Common and generally diffused from Fort Resolution to Alymer Lake. Its caterwauls and yodels are much like those of the Common Loon.

PACIFIC LOON. *Gavia pacifica*. Pacific or White-headed Loon. Common everywhere from Fort Resolution to Aylmer Lake, but most abundant on Great Slave Lake.

¹ For the identification of many species, chiefly the Gulls, I am indebted to Mr. E. A. Preble.

RED-THROATED LOON. *Gavia lumme*. Abundant everywhere from Fort Resolution to Aylmer Lake. It is the noisest of the Loons and has many notes quite unlike those of its kin. One of its cries is like the harsh squawk of a 'devil-fiddle,' and when three or four of the birds are doing it in chorus it suggests a band of hyænas, or a pack of goblin hounds in chase of a goblin buck.

PARASITIC JAEGER. *Stercorarius parasiticus*. Found throughout the region and quite common on the larger lakes of the Barren-grounds. It is usually seen in pairs. It lives much like a hawk or a raven, coming when a caribou is killed, to share in the offal. Once saw one capture a Lapland Longspur on the wing, and have often seen it pursuing ground-squirrels. The flight of the species is comparable with that of the swiftest falcons.

HERRING GULL. *Larus argentatus*. Abundant from Fort Resolution to Back's River, feeding much as Ravens do, on carrion, fish, etc. Will pursue wounded game and often follows the hunter to share in the kill.

CALIFORNIA GULL. *Larus californicus*. Abundant on Great Slave Lake.

SHORT-BILLED GULL. *Larus brachyrhynchus*. Very abundant on Great Slave Lake. Not seen farther east.

COMMON TERN. *Sterna hirundo*. Common around Delta of Great Slave River and noted in small numbers from there to the eastern end of Great Slave Lake. Evidently breeding.

ARCTIC TERN. *Sterna paradisæa*. Common on Great Slave River and Lake and Clinton-Colden and Alymer Lakes. Last seen, Alymer Lake Aug. 24. Much more abundant than the Common Tern.

DOUBLE-CRESTED CORMORANT. *Phalacrocorax dilophus*. Not seen by me, but I was credibly assured that a large number breed every year at Isle à la Crosse, N. lat. 56°, W. Long. 108°.

AMERICAN WHITE PELICAN. *Pelecanus erythrorhynchos*. The north most colony is that on Great Slave River at Mountain Rapids, 150 miles south of Fort Resolution. Here, about 80 pairs breed each year; on June 22 the young were beginning to hatch.

RED-BREASTED MERGANSER. *Merganser serrator*. Abundant on Great Slave Lake and northeast to Clinton-Colden; evidently breeding.

GREEN-WINGED TEAL. *Nettion carolinensis*. Common about the Slave River and Delta.

WHISTLER. *Clangula clangula americana*. Abundant along the Great Slave River, down to the Delta, not seen east of that; observed there Sept. 25.

LONG-TAILED DUCK. *Harelda hyemalis*. Generally distributed on the lakes of the Barren-grounds where it breeds. It was very abundant on Great Slave Lake in mid-September near Fort Reliance. doubtless migrating at the time.

WHITE-WINGED SCOTER. *Oidemia deglandi*. Saw four on Artillery Lake Sept. 8.

SURF SCOTER. *Oidemia perspicillata*. Saw a pair on Slave River Delta July 16 and found it very abundant on Great Slave Lake in mid-September.

LESSER SNOW GOOSE. *Chen hyperborea*. Saw a flock at the narrows of Great Slave Lake Sept. 20.

GRAY WAVEY. *Anser albifrons gambeli*. Saw three at the west end of Lake Aylmer Aug. 15, and others on the north shore of the same lake on the two following days.

CANADA GOOSE. *Branta canadensis*. Appears generally distributed up to the limit of trees. Saw a pair with their brood near Kahdinouay Island, Great Slave Lake, July 19.

HUTCHINS GOOSE. *Branta canadensis hutchinsii*. This is known to be the form of the Barren-grounds proper, so a flock of 20 seen near the southern end of Artillery Lake Sept. 9 were probably of this race.

WHISTLING SWAN. *Olor columbianus*. Not seen until the autumn migration; then saw two or three hundred in small flocks of 3 to 12 on Sept. 22, 23, 24 and 25, around the mouth of Great Slave River.

BITTERN. *Botaurus lentiginosus*. Generally distributed in Great Slave River region and quite common in the Delta about Fort Resolution but not noted farther east.

LITTLE BROWN CRANE. *Grus canadensis*. Generally distributed along Great Slave River. Common about Fort Resolution. Observed once only east of that:—on Sept. 14 saw a flock of 6 flying easterly over Fort Reliance.

CAROLINA RAIL. *Porzana carolina*. This species was common in the region south and up to Fort Resolution, but not noted farther northward or eastward.

YELLOW RAIL. *Porzana noveboracensis*. The peculiar flint-and-steel notes of this furtive species were heard frequently in the marshy country 50 miles south of Fort Resolution, along Little Buffalo Run, but no farther.

NORTHERN PHALAROPE. *Phalaropus lobatus*. One seen near Sandhill Bay, Aylmer Lake, Aug. 20.

WILSON SNIPE. *Gallinago delicata*. Abundant in all the bogs along Great Slave River to the Delta. Not seen beyond.

BAIRD SANDPIPER. *Actodromas bairdi*. Noted on Casba River Aug. 8, and on Aylmer Lake Aug. 13.

SEMPALMATED SANDPIPER. *Ereunetes pusillus*. During early August great flocks were seen on the Barrens but all disappeared by the middle of the month.

LESSER YELLOWLEGS. *Totanus flavipes*. A few seen on Casba River Aug. 8.

SPOTTED SANDPIPER. *Actitis macularia*. Abundant and breeding all along the Great Slave River and adjoining country, also sparingly from Fort Resolution, the whole length of Great Slave Lake to the edge of the woods. Saw it twice on the Barrens; at the east arm of Clinton-Colden Aug. 11, and on Aylmer Lake in mid-August.

SEMPALMATED PLOVER. *Ægialitis semipalmata*. Saw a few breeding birds on Artillery Lake in early August, and an occasional one on Aylmer Lake about the middle of the month.

RUFFED GROUSE. *Bonasa umbellus togata*. Generally distributed in the woods up to Fort Resolution. Not seen or heard east of the Great Slave Delta.

WILLOW PTARMIGAN. *Lagopus lagopus*. Very abundant on the Barrens, where exclusively it breeds, migrating to the woods for the winter.

ROUGH-LEGGED HAWK. *Archibuteo lagopus sancti-johannis*. Generally distributed from Fort Resolution to Aylmer Lake; evidently breeding.

GOLDEN EAGLE. *Aquila chrysaetos*. Noted throughout the region from Fort Resolution to Clinton-Colden Lake.

NORTHERN BALD EAGLE. *Haliaeetus leucocephalus alascanus*. Found throughout the country around Great Slave Lake, but less common than the Golden Eagle. On Sept. 23 I saw one pounce three times to catch a fish, but without success.

DUCK HAWK. *Falco peregrinus anatum*. Generally distributed; noted at Artillery Lake and at Aylmer; evidently nesting.

PIGEON HAWK. *Falco columbarius*. Observed at several places on Great Slave Lake in September, the most easterly being Fort Reliance, Sept. 14.

OSPREY. *Pandion haliaetus carolinensis*. Saw one at the narrows of Great Slave Lake on Sept. 20.

GREAT GRAY OWL. *Scotiaptex nebulosa*. Saw only one during the summer. It was in the country south of Fort Resolution on July 11; evidently breeding.

ARCTIC HORNED OWL. *Bubo virginianus arcticus*. Abundant about Fort Resolution, and seen on the Great Slave River Delta; not observed farther north.

WHITE OWL. *Nyctea nyctea*. First seen on north side of Clinton-Colden Lake Aug. 11. But evidently it is of general distribution in the Barren-grounds.

HAWK OWL. *Surnia ulula caparoch*. Reported generally, but I saw only one; that was collected by E. A. Preble on Artillery Lake Sept. 3. It was at the Last Woods and had evidently come northward after nesting.

NORTHERN FLICKER. *Colaptes auratus luteus*. This was the only woodpecker seen east of Fort Resolution; it was abundant all along the route to the edge of the woods, that is, a point some 20 miles northeast of Fort Reliance. It went southward about mid-September.

PHOEBE. *Sayornis phæbe*. Found nesting all along the route to Fort Resolution and northeasterly as far at least as the narrows of Great Slave Lake on the north shore at W. Long. 111°.

HOYT SHORE LARK. *Otocoris alpestris hoyti*. Common everywhere on the Barrens north to Aylmer Lake; in full song Aug. 29.

CANADA JAY OR WISKAJON. *Perisoreus canadensis*. Abundant everywhere to the edge of the woods, but not seen on the Barrens.

RAVEN. *Corvus corax sinuatus*. Abundant everywhere. Once saw 28 together on the Barrens.

COWBIRD. *Molothrus ater*. Slave River Delta, July 16.

REDWING. *Agelaius phoeniceus arctolegus*. Slave River Delta, July 16.

RUSTY BLACKBIRD. *Euphagus carolinus*. Noted at several points along Great Slave Lake. At Kipling Lake, on Pike's Portage, 10 miles east of Fort Reliance, saw young of the year, now fully fledged, July 29.

PINE GROSBEEK. *Pinicola enucleator*. First seen on Et-then Island, Great Slave Lake, Sept. 21. Afterwards seen daily as we journeyed southward.

RED CROSSBILL. *Loxia curvirostra minor*. Saw one on Great Slave River Delta, Sept. 28.

LESSER REDPOLL. *Acanthis linaria*. Common on Pike's Portage, 10 miles east of Fort Reliance July 30, and thence northward to the edge of the woods. Evidently on its breeding ground.

SNOWBIRD. *Passerina nivalis*. First seen on the large central island of Clinton-Colden Lake, Aug. 11. Old ones with young of the year. After that, while we were going northward, others were seen, evidently on their breeding grounds, but it was not a common species.

LAPLAND LONGSPUR. *Calcarius lapponicus*. Beginning exactly at the edge of the woods and continuing as far as we went in the Barrens, were countless Lapland Longspurs. I think I did not see a dry ten-acres in the treeless region that was without at least two pairs of Longspurs. During the time we were there, Aug. 1 to Sept. 8, they were in flocks, at first of half-a-dozen, but finally of hundreds; in migration at Fort Reliance Sept. 14.

PAINTED LONGSPUR. *Calcarius ornatus*. One seen on the north shore of Aylmer Lake Aug. 13.

WESTERN SAVANNA SPARROW. *Passerculus sandwichensis alaudinus*. Observed along the whole route in the Barrens, but nowhere plentiful and not seen in flocks. Several appeared about Fort Reliance in mid-September.

HOODED SPARROW. *Zonotrichia querula*. First seen on Kahinouay Island, Great Slave Lake, as we went North, July 20; it was there nesting. After that they were abundant, nesting in every large thicket right to the edge of the Barrens. In the Last Woods Aug. 5, I found the nest, the first I believe known to science. It was on the ground under a dwarf birch, was made of grass and resembled the nest of the White-throated Sparrow. It contained three young nearly ready to fly. I found this species in full song Sept 3.

GAMBEL SPARROW. *Zonotrichia gambeli*. Abundant on islands in Great Slave Lake in late July.

WHITE-THROATED SPARROW. *Zonotrichia albicollis*. Abundant at the mouth of the Great Slave River, but not seen farther northeasterly.

TREE SPARROW. *Spizella monticola*. First noted near the east end of Great Slave Lake; afterward abundant and nesting to the Barrens where there were small thickets. About the 1st of September the Tree Sparrows were gathered in small flocks to migrate and now were seen out on the Barrens many miles north of the summer range.

JUNCO. *Junco hyemalis*. Generally diffused, at least as far as the east end of Great Slave Lake.

LINCOLN FINCH. *Melospiza lincolni*. Nesting in the vicinity of Fort Resolution.

SWAMP SPARROW. *Melospiza georgiana*. Seen near Fort Resolution July 16.

FOX SPARROW. *Passerella iliaca*. Nests north to the edge of the woods, one noted at Last Woods on Artillery Lake Aug. 5. Also observed at Pike's Portage, east end of Great Slave Lake, Sept. 11.

CLIFF SWALLOW. *Petrochelidon lunifrons*. Abundant, nesting in great colonies in the cliffs of Great Slave and Artillery Lakes, but not seen farther.

BARN SWALLOW. *Hirundo erythrogaster*. Several were seen July 21, about the tall cliffs of Et-then which is a large island in the north side of Great Slave Lake, W. Long. 112° 20'. Doubtless they nest there.

WHITE-BREASTED SWALLOW. *Iridoprocne bicolor*. Common at Fort Resolution. Not seen farther northeast.

BANK SWALLOW. *Riparia riparia*. Found in thousands along the Great Slave River to Fort Resolution. Not seen farther northeasterly.

NORTHERN SHRIKE. *Lanius borealis*. Saw two at Fort Reliance Sept. 15.

RED-EYED VIREO. *Vireo olivaceus*. Common about Fort Resolution.

TENNESSEE WARBLER. *Helminthophila peregrina*. One seen near the eastern end of Great Slave Lake July 28.

YELLOW WARBLER. *Dendroica aestiva*. Fairly common, and nesting at Fort Resolution, and thence to the north shore of Great Slave Lake, at least as far east as W. Long. 109°.

BLACK-POLL WARBLER. *Dendroica striata*. Female observed feeding young at Artillery Lake, Aug. 5.

MYRTLE WARBLER. *Dendroica coronata*. On Sept. 3 a small flock appeared at Last Woods, Artillery Lake. This may be a northward fall migration.

WILSON BLACK-CAP. *Wilsonia pusilla*. Preble collected one at Last Woods, Artillery Lake, Sept. 5. Another north migrant in fall.

WESTERN WATER-THRUSH. *Seiurus noveboracensis notabilis*. Common about the Slave River Delta in mid-July.

PIPIT. *Anthus pensilvanicus*. First seen July 24 on north shore of Great Slave Lake about W. Long. 110°, probably nesting; thence northward to Clinton-Colden Lake. Very abundant in migration at Fort Reliance in mid-September.

LONG-TAILED CHICKADEE. *Parus atricapillus septentrionalis*. Abundant along Great Slave River to the Delta; not seen afterwards.

HUDSONIAN CHICKADEE. *Parus hudsonicus*. Abundant along Great Slave River and on the islands of Great Slave Lake to the north shore about W. Long. 112°. Not seen farther north or east.

GRAY-CHEEKED THRUSH. *Hylocichla aliciae*. Abundant, and apparently nesting from Kahdinouay Island, middle of Great Slave Lake, to south end of Artillery Lake. Common at Fort Reliance on Sept. 14.

OLIVE-BACKED THRUSH. *Hylocichla ustulatus swainsonii*. Abundant along Great Slave River to near Fort Resolution, but not beyond.

HERMIT THRUSH. *Hylocichla aonalaschkæ pallasii*. Common in dry woods along Great Slave River north to Kahdinouay Island in Great Slave Lake, not beyond.

ROBIN. *Merula migratoria*. Abundant and nesting throughout the wooded region traversed, as far as the edge of the woods. In the first week of September the species appeared in flocks on the edge of the Barrens.

TWENTY-FIFTH STATED MEETING OF THE AMERICAN ORNITHOLOGISTS' UNION.

THE Twenty-fifth Stated Meeting of the American Ornithologists' Union convened in Philadelphia, Pa., Monday evening, December 9, 1907. The business meeting was held in the Council Room, and the public sessions, commencing Tuesday, December 10, and lasting three days, were held in the lecture hall of the Academy of Natural Sciences.

BUSINESS SESSION.—The meeting was called to order by the President, Mr. Charles F. Batchelder. Twenty Fellows were present. The Secretary's report gave the membership of the Union at the opening of the present Stated Meeting as 850, constituted as follows: Fellows, 48; Honorary Fellows, 14; Corresponding Fellows, 61; Members, 72; Associates, 655.

During the year the Union lost eighty-one members, eleven by death, thirty-two by resignation, and thirty-eight for non-payment of dues. The deceased members include two Honorary Fellows, one Corresponding Fellow, one Member, and seven Associates, as follows: Prof. Alfred Newton,¹ an Honorary Fellow, who died in Cambridge, England, June 7, 1907, at the age of 78 years; Howard Saunders,² an Honorary Fellow, who died in London, Oct. 20, 1907, aged 72 years; Dr. Rudolph Blasius, a Corresponding Fellow, who died in Braunschweig, Germany, Sept. 21, 1907; Dr. William L. Ralph,³ a Member, who died in Washington, D. C.,

¹ For an obituary notice, see Auk, XXIV, pp. 365, 366.

² For an obituary notice, see Auk, XXV, pp. 103-104.

³ For an obituary notice, see *Ibid.*, XXIV, pp. 461, 462.

July 8, 1907, in the 57th year of his age; and the following Associates: August Koch,¹ who died at Mohawk, Florida, Feb. 15, 1907, aged 70 years; Mrs. Jacob L. Sweiger,² who died in Waterbury, Conn., March 24, 1907, in the 47th year of her age; Walter R. Davis, who died in Newton, Mass.; Mrs. Isabel Paddock Carter,³ who died Sept. 15, 1907, at St. Johnsbury, Vt., aged 36 years; Frank T. Antes, who died Feb. 16, 1907; Charles F. Brennan, who died Mch. 21, 1907, and Alexander Maitland, who died at Princeton, N. J., Oct. 25, 1907.

The report of the Treasurer showed the finances of the Union to be in a satisfactory condition.

All of the officers were reëlected as follows: Charles F. Batchelder, President; E. W. Nelson and Frank M. Chapman, Vice-Presidents; John H. Sage, Secretary; Jonathan Dwight, Jr., Treasurer; Ruthven Deane, William Dutcher, A. K. Fisher, F. A. Lucas, Chas. W. Richmond, Thos. S. Roberts, and Witmer Stone, members of the Council.

Richard C. McGregor, of the Bureau of Science, Manila, Philippine Islands, was elected a Fellow; Dr. Carl R. Henniecke, of Gera, Reuss, Germany, and Dr. Sergius A. Buturlin, of Wesenberg, Esthonia, Russia, were elected Corresponding Fellows; Ned Dearborn, of Chicago, Ills.; E. Howard Eaton, of Rochester, N. Y.; William L. Finley, of Portland, Oregon, and Ora Willis Knight, of Bangor, Maine, were elected to the class of Members, and the following one hundred and twenty-three persons were elected Associates, namely:

Rudolph M. Anderson, Macon, Mo.; Lyle S. Baer, Streator, Ills.; Frank C. Baker, Chicago, Ills.; Blenn R. Bales, M. D., Circleville, Ohio; Miss Anna K. Barry, Dorchester, Mass.; Frederick MacD. Barton, Concord, Mass.; Hermann Behr, Jennings, Md.; Otto Behr, Lopez, Pa.; John J. Beice, Oakville, Calif.; Isaac Bildersee, New York City; John J. Bishop, Springfield, Mass.; Maurice C. Blake, Hanover, N. H.; C. L. Bobb, Madison, Wis.; John I. D. Bristol, New York City; Winthrop S. Brooks, Milton, Mass.; Freeman F. Burr, East Haven, Conn.; Philip L. Buttrick, New Haven, Conn.; George I. Carpenter, Brooklyn, N. Y.; John D. Carter, Lansdowne, Pa.; M. A. Carriker, Jr., Nebraska City, Neb.; Mrs. Arthur P. Chadbourne, Boston, Mass.; W. Lee Chambers, Santa Monica,

¹ For an obituary notice, see Auk, XXIV, pp. 238, 239.

² For an obituary notice, see Auk, XXV, p. 105.

³ For an obituary notice, see Auk, XXV, pp. 104-105.

Calif.; Ralph W. Chaney, Chicago, Ills.; B. Preston Clark, Boston, Mass.; Chas. E. Clark, Arlington, Mass.; Howard H. Cleaves, Princes Bay, Staten Is., N. Y.; Edward J. Court, Washington, D. C.; H. C. Curl, Washington, D. C.; David W. Dennis, Richmond, Ind.; Thomas W. Dewing, New York City; Donald R. Dickey, Dubuque, Iowa; Geo. E. Dimock, Jr., Elizabeth, N. J.; Dr. Frederick W. D'Evelyn, Alameda, Calif.; Stanley W. E. Edwards, Hartford, Conn.; Samuel P. Fay, Boston, Mass.; Jesse D. Figgins, New York City; Walter Fisher, Chicago, Ills.; Edwin S. Ford, Morristown, N. J.; Miss Hannah Fox, Philadelphia, Pa.; Dwight Franklin, New York City; Clarence T. Fuller, Brooklyn, N. Y.; R. T. Fuller, Lacona, N. Y.; Burton N. Gates, Worcester, Mass.; M. French Gilman, Shiprock, N. M.; Chapman Grant, Williamstown, Mass.; Alfred O. Gross, Urbana, Ills.; Francis Harper, College Point, N. Y.; Miss Pauline Hayes, Centralia, Ills.; Ralph H. Holman, Malden, Mass.; Ernest G. Holt, Montgomery, Ala.; Albert W. Honywill, Jr., New Haven, Conn.; Benjamin F. Howell, Jr., Boonton, N. J.; William H. Hoyt, Stamford, Conn.; Dr. L. L. Hubbard, Houghton, Mich.; Rev. H. W. Kellogg, Wilmington, Del.; Edwin C. Kent, Tuxedo Park, N. Y.; Raymond Kester, Philadelphia, Pa.; Axel J. de Lagerberg, Passaic, N. J.; Herbert Lang, New York City; J. Eugene Law, Hollywood, Calif.; John B. Lawrence, New York City; Carl C. Lawson, Chicago, Ills.; Walter H. Leibelsperger, Fleetwood, Pa.; Harry J. Lelande, Los Angeles, Calif.; William B. Long, Brookline, Mass.; Paul Loveland, Minneapolis, Minn.; Ethelbert I. Low, New York City; Henry H. Lowell, Newton Centre, Mass.; Richard M. Marble, Brookline, Mass.; Edward J. F. Marx, Easton, Pa.; Rev. E. Mead, Passaic, N. J.; Chas. M. Metz, Sheridan, Wyo.; Richard F. Miller, Philadelphia, Pa.; Miss Margaret Morse, Worcester, Mass.; Dr. Fred Mutchler, Worcester, Mass.; Nathaniel C. Nash, Jr., Cambridge, Mass.; Edward A. Nehling, Passaic, N. J.; J. Hosey Osborn, Passaic, N. J.; Clifford H. Pangburn, New Haven, Conn.; Theed Pearse, Crozet, Va.; L. S. Pearson, Wayne, Pa.; Max Minor Peet, Ann Arbor, Mich.; Philip B. Philipp, New York City; Francis W. Rawle, Rosemont, Pa.; Alfred C. Redfield, Wayne, Pa.; Chas. Richardson, Jr., Pasadena, Cali.; Fitzhugh Salley, Holly Hill, S. C.; Joseph A. Santens, Pittsburgh, Pa.; A. F. Satterthwait, Harrisburg, Pa.; Aretas A. Saunders, New Haven, Conn.; Orpheus M. Schantz, Morton Park, Ills.; Samuel Scoville, Jr., Philadelphia, Pa.; Robert P. Sharples, West Chester, Pa.; Althea R. Sherman, National, Iowa; George Shiras, 3rd., Washington, D. C.; Jesse L. Smith, Highland Park, Ills.; N. A. C. Smith, Worcester, Mass.; Edgar C. Stiles, West Haven, Conn.; J. Fletcher Street, Beverly, N. J.; Carlton B. Swift, Southborough, Mass.; F. L. van Tassell, Passaic, N. J.; Alex. R. Taylor, Columbia, S. C.; Lewis McI. Terrill, Westmount, Quebec; Almerin D. Tinker, Ann Arbor, Mich.; Gilbert Trafton, Passaic, N. J.; J. H. Trumbull, Plainville, Conn.; Dr. Henry Tucker, Philadelphia, Pa.; Mrs. Wm. H. Upham, Marshfield, Wis.; Miss Edith Van Deusen, Rutherford, N. J.; Justus Von Lengerke, New York City; Dr. Albert H. Wallace, Upper Montclair, N. J.; James S. Wallace, Toronto, Canada; Galen Watson, North Scituate, Mass.; J. A. Weber, New York City; Francis M. Weston, Jr., Mount Pleasant, S. C.; Cornelius Weygandt,

Philadelphia, Pa.; William P. Wharton, Groton, Mass.; Chas. E. Wisner, Detroit, Mich.; Miss Harriet H. Wright, Saginaw, W. S., Mich.; Howard W. Wright, Pasadena, Calif.; Luther E. Wyman, Chicago, Ills.; John A. Young, New York City; Mrs. William A. Young, West Newton, Mass.

Drs. Allen, Dwight, Merriam and Richmond, and Messrs. Brewster, Ridgway and Stone were reappointed 'Committee on Classification and Nomenclature of North American Birds.'

Drs. A. K. Fisher, E. A. Mearns and Thos. S. Roberts, and Messrs. Chapman and Nelson were appointed 'Committee on Bird Protection.'

The amendment to the By-Laws, proposed at the last Stated Meeting of the Union, was adopted, as follows:

Life membership, exempting the holder from all further fees or assessments, may be obtained by a Fellow on payment of one hundred dollars, by a Member on payment of seventy-five dollars, or by an Associate on payment of fifty dollars. But any Member or Associate, in event of his election to a higher class of membership, must then pay such additional sum as will make his total payments for life membership equal to the amount required for the class to which he is elected. In default of such payment his life membership lapses; but in that event there shall be credited toward his future annual assessments, any excess there may be in the amount he has already paid for life membership over that which he otherwise would have paid as annual assessments during the time he has held life membership.

A vote of thanks was unanimously tendered Dr. Jonathan Dwight, Jr., by the Council of the Union, in recognition of the vast amount of time and labor expended by him in compiling and editing the 'Index' (just published) to the 'Bulletin of the Nuttall Ornithological Club' and 'The Auk,' covering the period of twenty-five years, 1876-1900, and for the great care and thoroughness with which the work was done.

PUBLIC SESSIONS. *First Day.*—The meeting was called to order by the President, Mr. Batchelder. An address of welcome was made by Dr. Dixon, on behalf of the Academy of Natural Sciences.

The papers read during the morning session were as follows:

'Preliminary Report of an Investigation of the Cause of Mould

and the Seasonal Change of Color in Birds,' by C. William Beebe. Remarks followed by Dr. Merriam, the author, and Mr. Stone.

'The Faunal Status of the Finger-Lake Country in New York,' by E. Howard Eaton. Remarks followed by Dr. Merriam, the author, and Mr. Stone.

'Pennant's Indian Zoology, 1769 Edition,' by Dr. J. A. Allen.

'Some Ornithological Doings of the Years 1850-1855,' by Witmer Stone.

'Bird Population and its Modifying Influences,' by Prof. Joseph Grinnell. In the absence of the author it was read, and remarked upon, by Dr. Merriam.

The papers of the afternoon, all illustrated by lantern slides, were:

'Breeding Birds of Carroll Islet, Washington,' by Prof. Lynds Jones.

'Report on Field Work for the American Museum of Natural History, in the South Atlantic States and the Bahamas, in April and May, 1907,' by Frank M. Chapman.

'The Expression of Emotion in Birds as Shown by Photography,' by Clinton G. Abbott.

In the evening the members of the Union, and their friends, met at dinner in the Banquet Hall of Boothby's Café. The after dinner speeches had reference, mainly, to the organization, growth, and present high standing of the Union, this being its twenty-fifth annual meeting.

Second Day.—The meeting was called to order by President Batchelder. The papers of the morning session were:

'Notes on Several Birds Living in the New York Zoological Park, and on an Apparatus for Making More Vivid the Evolution of any Group of Birds,' by C. William Beebe.

'New Bird Records from Great Slave Lake,' by Ernest Thompson Seton.

'The Ornithological Background,' by Dr. Spencer Trotter.

'The Value of Colors and Color-patterns as a Generic Character in Ornithology,' by Witmer Stone. Remarks followed by Mr. Beebe, the author, and Dr. Allen.

'Notes on Woodpeckers and their Plumage,' by W. E. Clyde Todd. Remarks followed by Mr. Fuentes.

'Notes on Some Porto Rican Birds,' by B. S. Bowdish.

The following papers, all illustrated with lantern slides, were presented at the afternoon session:

'The Psychologic Development of Young Hawks,' by E. Howard Eaton. Remarks followed by Mr. Seton.

'Report on Field Work for the American Museum of Natural History, in Saskatchewan and Alberta, in June and July, 1907,' by Frank M. Chapman. Remarks followed by Messrs. Seton and Fleming, and Dr. Bishop.

'The Wild Life of Home Birds,' by Rev. Herbert K. Job.

In the evening the visiting members of the Union were invited to a Smoker at the Academy, tendered by members of the Ornithological Section. It was conceded by all present to have been a most enjoyable gathering.

Third Day.—The meeting was called to order by President Batchelder. The papers of the session were:

'The Geographical Distribution of the Juncos (or Snowbirds), and the Probable Significance of their Color Variations,' by Dr. Jonathan Dwight, Jr. Remarks followed by Rev. H. K. Job, the author, and Dr. Trotter.

'Some Additions to the Birds of Delaware,' by Chas. J. Pennock.

'The Generic Names *Mycteria* and *Tantalus*,' by Dr. J. A. Allen.

'Status of the Henslow's Sparrow in Connecticut,' by Geo. P. Ells. Remarks followed by Dr. Bishop, Mr. Woodruff, and the author.

'International Bird Protection in Europe,' by Henry Oldys. In the absence of the author it was read by Mr. W. H. Osgood.

Resolutions were adopted thanking the Academy of Natural Sciences for the use of a hall for a place of meeting for the Union, and for other courtesies extended; to the Local Committee and other Philadelphia ornithologists for the cordial welcome and most generous hospitality shown visiting members and friends of the Union, and to the Zoölogical Society of Philadelphia for its kind invitation to visit the Gardens of the Society.

After the adoption of the resolutions, Dr. A. K. Fisher spoke to add a further expression of the enthusiasm felt by the visiting members in regard to the exceptionally interesting and enjoyable character of the sessions just closing.

On Friday, December 13, after adjournment of the Union, Messrs. Stewardson Brown and George Spencer Morris conducted a party to the historic Bartram's Garden so intimately associated with the life of Alexander Wilson, and on the 14th a "pilgrimage" was made to Mill Grove, on the Perkiomen, the former home of Audubon.

The next meeting of the Union will be held in Cambridge, Mass., commencing November 16, 1908.

The attendance of members at the twenty-fifth anniversary of the founding of the Union was much larger than at any previous Stated Meeting — the Pacific Coast and Canada being well represented.

JNO. H. SAGE,
Secretary.

GENERAL NOTES.

The Canvasback at Bridgewater, Mass. — For many years until the 19th of October, 1907, there is no record of the Canvasback (*Aythya valisneria*) at Nippenickett Pond, Bridgewater, Mass. Upon the above date Elbert L. Hall and Irving Hall shot six birds of this species from a flock of thirteen. All the captured ones, and as nearly as could be learned all those escaping, were in either the female or immature male plumage. — ARTHUR C. DYKE, *Bridgewater, Mass.*

Capture of a Tagged Canvasback Duck. — On October 25 there was killed in Manahawkin Bay, New Jersey, a hen Canvasback Duck with an aluminum band on its leg containing the initials and number "T. J. O. D. 48." It would be interesting to know who banded this duck and for what purpose. — HENRY OLDYS, *Acting in Charge of Game Protection, Bureau of Biological Survey, Washington, D. C.*

An American White-fronted Goose and Wilson's Phalarope in Essex County, Massachusetts. — At Great Neck, Ipswich, Mass., early in August, 1907, an American White-fronted Goose (*Anser albifrons gambeli*), in a wounded condition, was caught by Mr. A. B. Clark, and confined in his yard. I saw the bird on August 25. It was an adult in full plumage, and appeared to have been wounded in one wing and in the leg on the same side.

This is the first definite record for Essex County, although in the early days this goose is believed to have been a not uncommon migrant. Howe and Allen in their 'Birds of Massachusetts' give only two definite records for the State. One of these was shot in Quincy about 1849, the other at Plymouth on November 26, 1897.

On August 18, 1907, a young female Wilson's Phalarope (*Steganopus tricolor*) was shot at Salisbury, Mass., and sent to Faneuil Hall Market, Boston. Here it was identified by Mr. John H. Hardy, Jr., and kindly given by him to the writer, in whose collection it now rests. This is the second instance of the capture of this western Phalarope in Essex County, and the fourth for the State. One of these was taken near Boston about 1833; one was taken in Essex County, at Nahant, on May 20, 1874, and one was taken at Nantucket on August 31, 1889.—CHARLES W. TOWNSEND, M. D., *Boston, Mass.*

Rallus virginianus a Delaware Valley Breeder.—In my numerous explorations of the Pensauken Creek marshes during the past four years I failed to find this bird until June, 1907. It was on the morning of the 15th that Mr. B. W. Griffiths and I were standing in front of our woodland cabin looking out over the marsh when a Virginia Rail came to the edge of the ditch which divides the marsh here and is used to get our boats from the house to the creek. The bird crossed the ditch and disappeared among the vegetation whence it uttered a number of clucking notes and, to our surprise, there appeared at the ditch's edge four black, downy young rails. One after another they took to the water in the ditch and swam across disappearing among the spatter-docks and water-arum. This was on the Camden County side of Pensauken Creek, N. J., and about seven miles from the Philadelphia City Hall.—CHRESWELL J. HUNT, *Philadelphia, Pa.*

The Florida Gallinule, Stilt and Buff-breasted Sandpipers near Portland, Me., in 1907.—On October 15, a female Florida Gallinule (*Gallinula galeata*) was shot at Atlantic House Pond, Scarborough Maine. It passed into my collection. Its gullet contained three specimens of *Planorbis campanulatus*, and its stomach another. In the gizzard were a number of seeds. I am not aware of the previous capture of the bird at Scarborough, though two are recorded from Falmouth in 1894 (*cf.* Brock, Auk, XIII, p. 255).

The only Stilt Sandpiper (*Micropalama himantopus*) that I have heard of in this vicinity this fall was taken near Pine Point, Scarborough, a day or two previous to September 26. It passed into the collection of Bowdoin College.

On September 5, a beautiful male Buff-breasted Sandpiper (*Tryngites subruficollis*) was taken in Scarborough, near Pine Point. It is now in my collection. Mr. Blanchard Pillsbury who brought it to my attention,

informs me that it is the only specimen that has come to his notice for at least three years.—ARTHUR H. NORTON, *Portland, Me.*

The Ruff at Seabrook, N. H.—On September 24, 1907, I received a specimen of a European Ruff (*Pavoncella pugnax*) shot at Seabrook, N. H. The bird was a young female and the man who sent it to me said it was in company with a flock of ten or twelve Beetle-head Plover.

I would like to add—as some one not very long ago stated in 'The Auk' that he considered the Stilt Sandpiper extremely rare in Massachusetts—that I have within two years received 18 or 20 birds of this species in one day from near Newburyport, Mass.—JOHN H. HARDY, JR., *Arlington, Mass.*

Capture of the White-winged Dove in the State of Washington.—It gives me pleasure to record the capture of an adult female White-winged Dove (*Melopelia leucoptera*), which I collected Nov. 7, 1907, in the Puyallup River Valley. It forms the first record for this species for the State of Washington. It was alone and rather wild, necessitating a long wing shot to secure it. The feet and feathers being in perfect condition excludes any possibility of its being a cage-bird, even if such a thing were likely in this part of the country.—J. H. BOWLES, *Tacoma, Wash.*

Capture of the American Goshawk and Harris's Sparrow near Chicago, Ill.—A fine specimen of the American Goshawk (*Accipiter atricapillus*) was shot by L. E. Wyman, in the woods at River Forest on the Desplaines River, near Chicago, October 19, 1907. The bird, a female, was in magnificent plumage and of unusual size, measuring 25 inches in length with a spread of 46½ inches. The stomach was entirely empty, but a feast was in sight in the shape of a large white hen, which it lifted several feet from the ground; the second time both settled to earth after a shot from a small 44-gauge collecting gun, the hen escaping under the fence to the barnyard near by.

Nelson reported them very rare in 1876, and the only records for this section of Illinois are that of Woodruff, who shot a male March 30, 1889, and the two instances mentioned in Mr. Ruthven Deane's article on the American Goshawk, in 'The Auk,' for April, 1907.

I might mention another rare bird taken by Mr. Wyman October 13, 1907, at Beach, Lake Co., Ill., a male Harris Sparrow (*Zonotrichia querula*). It flushed from the ground to a small pine in company with a lot of Juncos (*Junco hyemalis*). Nelson reported this sparrow rare in 1876, and since then the specimen obtained by J. O. Dunn in 1895, and one seen in Lincoln Park by Ruthven Deane May 11, 1904, seem to be the only other records.—FRANK S. DAGGETT, *Chicago, Ill.*

A Large Migration of Hawks.—The guests at Lake Minnewaska, N. Y., had an opportunity in September to see the migration of large numbers of

hawks, presumably the Broad-winged. I enclose a letter from Mr. Kirk Munroe, the author, stating what he saw, and give you my own statement of what I saw myself, my estimates being, in all cases, moderate, and the numbers in some cases being from actual count. The birds were in most cases circling, in some cases sailing straight forward, a beat of the wings being extremely rare. As, in clear weather, the birds were very high, and in bad weather the light was very poor, I will not insist too strenuously upon my identification of the hawks as the Broad-winged, but I am substantially certain. The flocks were moving, in the main, from northeast to southwest, but parts of some of the flocks turned off to the west.

The flocks were accompanied, or followed, occasionally, by Red-shouldered Hawks; once or twice, apparently, by Fish Hawks; twice by Marsh Hawks, and once by an Eagle.

The flocks seen by me, then, numbered as follows:—Sept. 15, 30; Sept. 16, 15; Sept. 17, 11 and 30; Sept. 20, 35, 35, 50, 66, 10, 23, 50, 15, 40; Sept. 21, 30.

Those seen by Mr. Munroe, as will be noticed, were seen mostly on a day when I saw none, thus making the grand total very large. It may be that what we saw was not unusual, and therefore not worthy of special notice; but if it was at all out of the common, your readers will, no doubt, like to hear of it.—ROBT. BARBOUR, *Montclair, N. J.*

[Mr. Munroe's letter to Mr. Barbour, referred to above, is as follows:]

DEAR MR. BARBOUR:—A few days since: or to be more explicit, on the 18th inst., while on a walking trip to the Ice Caves of the Shawangunk Mountains near Ellenville, N. Y., in company with three Columbia College boys, I witnessed a most astonishing migratory flight of Broadwinged(?) Hawks concerning which I should like some further information.

When our attention was attracted to the birds we had come out from the caves and were eating our lunch on the summit of a rocky ridge from which we had an uninterrupted view of the sky as well as of a vast extent of territory on either side. The forerunners of the migration were a few stragglers that only caused comment by their undeviating and unhesitating southward flight. These leaders were, however, quickly followed by other birds in ever increasing numbers until the marvellous flight extended as far as the eye could reach to the eastward; and upwards to a point where the great birds appeared no larger than so many sparrows.

When the hawks first aroused curiosity by their numbers, one of my companions undertook to count them; but having counted fifty in less than one minute, he gave over the attempt, and was glad to have done so when, at the end of an hour the incredible flight still continued without pause or diminution.

I cannot venture even to guess how many hawks passed above us during that time; but know that they numbered well up among the thousands, and I write to ask if ever before you heard of a hawk migration on so vast a scale?

I would add that three days after encountering this remarkable flight, I witnessed another of the same character, only this time numbering but two or three hundred individuals, taking the same southerly direction over Sam's Point, but a few miles from the caves visited on the previous occasion.

If you can tell me where these countless thousands of hawks came from, whither they were bound, upon what they subsist while travelling, or if you can throw any other light upon the subject you will greatly oblige,

Yours most truly,

KIRK MUNROE.

New Massachusetts Records for the Hawk and Great Gray Owls.— I have just secured for the Thoreau Museum of Natural History, at the Middlesex School, Concord, Massachusetts, a specimen of the Hawk Owl (*Surnia ulula caparoch*) shot in the Lake Walden woods on the border of Lincoln, Mass., in February, 1907, and one of the Great Gray Owl (*Scotioptex nebulosa*) shot in the Hoar woods, in Concord, Mass., in December, 1906. With these I have also secured specimens of the Great-horned, Snowy, Short-eared, Long-eared, Barred, Screech and Acadian Owls, all taken in Concord during the past few years. These were shot by Henry C. Wheeler, a trapper and woodsman of Concord. This Hawk Owl makes, I believe, the fourteenth record for the State, and the Great Gray the eighteenth. A careful investigation into their capture leaves no doubt in my mind as to their authenticity.— REGINALD HEBER HOWE, JR., *Concord, Mass.*

Chestnut-collared Longspur (*Calcarius ornatus*) **in Maryland.**— It is with pleasure that I add another species to the list of Maryland birds, namely, the Chestnut-collared Longspur, adult male. The specimen was shot August 20, 1906, by Captain Annsley Ludlam of Ocean City, Md., on the Thoroughfare farm just beyond the drawbridge across Assateague Bay and west of the north end of Ocean City and in full view of it. It was found on a sandy knoll with but little grass and that short and scrubby. Recognizing it as a bird he did not know he shot it and brought it to me. I packed it in ice and sent it to the Smithsonian Institution where it now is.— F. C. KIRKWOOD, *Oldtown, Alleghany Co., Md.*

Nelson's Sparrow (*Ammodramus nelsoni*) **on Long Island, N. Y.**— It is with satisfaction that Nelson's Sharp-tailed Sparrow is herewith recorded as taken within Long Island boundaries. This species was included in the 'List of the Birds of Long Island, New York,' which appears in the last number of 'Abstracts of the Proceedings of the Linnæan Society of New York,' with some hesitation, since search through the literature, collections of birds and generously offered field-notes of others failed to confirm my assumption that it was certainly a migrant. Dr. Bishop found it on the

Connecticut shore of Long Island Sound, in late September and October, and it was therefore made an exception, and included, as was clearly stated in the note on this species (p. 82), without its having ever been taken on Long Island. A specimen was first secured by the writer on October 5, 1907, at Rockaway Beach.—WILLIAM C. BRAISLIN, M. D., Brooklyn, N. Y.

The Tree Swallow Nesting in the Delaware Valley.—On July 7, 1907, while boating on the Rancocas we found a Tree Swallow's nest in a hole in a pile near Bridgeboro, Burlington County, N. J., less than five miles from the Delaware River. It contained five well incubated eggs. While this bird is a somewhat common breeder throughout the Pine Barren region of southern New Jersey it is rarely found nesting within the Delaware Valley.—CHRESWELL J. HUNT, Philadelphia, Pa.

The Name of the California Least Vireo.—In 'The Condor' for November, 1901, page 187, I named and described *Vireo pusillus albatius*, with type from Pasadena, distinguishing it from *Vireo pusillus* Coues, from Arizona. In his 'Birds of North and Middle America,' Part III, 1904, page 207, Mr. Ridgway describes *Vireo bellii arizonae*, with type from Tucson, and distinguishes it from *V. b. medius* of Texas and *V. b. pusillus* (page 208) of California. He cites my name *albatius* as a synonym of *pusillus*, and gives the type of *Vireo pusillus* Coues as from "Cape San Lucas, Lower California; coll. U. S. Nat. Mus."

I have not the original description of *pusillus* to refer to; but turning to Coues's 'Birds of the Colorado Valley,' 1878, page 531, I find in the synonymy "**Vireo pusillus**, Coues, Pr. Phila. Acad. 1866, 76 (descr. orig.; near Fort Whipple, Ariz.)." Further down the page the habitat is given as "Arizona, chiefly in its lower portions, and California from Sacramento to Cape St. Lucas." Furthermore, on the next page (532), Coues makes the following definite statement: "The type-specimen of *Vireo pusillus* was shot on Date Creek, in Arizona, June 6, 1865, [etc., in regard to circumstances of capture]"; and further, "it [the species] remained undescribed until the following year, when I overhauled my Arizona collections at the Smithsonian in Washington." Also, the description (on page 531) applies far better (in fact precisely) to the Arizona race than to that of California.

In view of the above statements by its original describer I cannot understand by what process the type-ship of *pusillus* could possibly be imposed upon a Cape San Lucas specimen. The type bird is stated by Coues to have come from Arizona, and that it was shot by himself at a certain place there. That specimen, according to Baird, in his 'Review of American Birds,' 1866, page 361, bore the "Smithsonian No. 40,696." In the ultimate recognition of a separate race in California, the name *pusillus* should apply to the Arizona form as restricted, while the California form is open to naming. This I did; and since intergradation has been shown to exist between the extremes in the species, how can the name of the California

Least Vireo be other than *Vireo bellii alatus*, and that of the Arizona Least Vireo other than *Vireo bellii pusillus*? — J. GRINNELL, Pasadena, California.

Lawrence's and Brewster's Warblers and Mendelian Inheritance.— In any discussion of the status of Lawrence's and Brewster's Warblers it is well to bear in mind that the facts, including the much greater abundance of Brewster's, are in accord with Mendel's Law of Heredity, supposing both forms to be hybrids between *Helminthophila pinus* and *H. chrysoptera*. I have written out an hypothetical explanation of the case along these lines, signalizing the two most prominent varying characters of the birds, namely, color of underparts and presence or absence of black throat patch. Familiarity with Mendel's Law is taken for granted, and I would refer anyone to whom it is not familiar to an excellent article on the subject by W. E. Castle in Volume XXXVIII of the Proceedings of the American Academy of Arts and Sciences, January, 1903.

Let W stand for "white below"; w stand for "absence of white," *i. e.*, "yellow."

Let P stand for "plain throat"; p stand for "absence of plainness," *i. e.*, "black throat."

Then *H. chrysoptera* is pW; *H. pinus* is Pw; PW (the pure dominant) is Brewster's Warbler; pw (the pure recessive) is Lawrence's Warbler. *H. chrysoptera* × *H. pinus* is pWPw, but in plumage PW, Brewster's Warbler. All the first generation hybrids will be Brewster's Warbler in plumage. In the next generation there will be pure Golden-winged Warblers, pure Blue-winged Warblers, pure Brewster's Warblers, and pure Lawrence's Warblers; also mixed birds of the first three forms, but none of the last form, which, being recessive, comes to light only when pure. The original hybrids then (which will be all Brewster's in plumage) must be fertile with one another or with the parent species for any Lawrence's to occur; and if they are perfectly fertile Lawrence's must still remain a small minority. After the first generation the proportion of plumages of birds with mixed parentage should be: 9 Brewster's, 3 *chrysoptera*, 3 *pinus*, 1 Lawrence's. See Table.

In plumage		In plumage	
PWPW	Brewster's	PWPw	Brewster's
pwPW	Lawrence's	PWpw	"
PwPw	<i>pinus</i>	PwPW	"
pWpW	<i>chrysoptera</i>	pWPW	"
Pwpw	<i>pinus</i>	PWpw	Brewster's
pWpw	<i>chrysoptera</i>	pWPw	"
pwPw	<i>pinus</i>	pwPW	"
pwpW	<i>chrysoptera</i>	PwpW	"

9 Brewster's, 3 *chrysoptera*, 3 *pinus*, 1 Lawrence's.— JOHN TREADWELL NICHOLS, New York City.

The Prairie Warbler near Chicago.—I beg to report taking a male Prairie Warbler (*Dendroica discolor*), at Riverside, Ill., ten miles west of Chicago, on May 8, 1907. This is a rare species here. Apparently the only definite records for this locality of those of Mr. Geo. Clingman of June, 1878, and May, 1892, mentioned by Mr. F. M. Woodruff in his 'Birds of the Chicago Area.'—L. E. WYMAN, *Chicago, Ill.*

The Kentucky Warbler in Southern New Jersey.—On May 19, 1907, Mr. Richard F. Miller and myself found two Kentucky Warblers along the Pensauken Creek. While locally an abundant species on the Pennsylvania side of the Delaware (in fact a common breeder in Fairmount Park, Philadelphia), this bird seems rarely to cross the river. I can find no other records for southern New Jersey.—CHRESWELL J. HUNT, *Philadelphia, Pa.*

Another Cañon Wren Record for Colorado.—There are few records of this wren (*Catherpes mexicanus conspersus*) in Colorado. To-day (October 20, 1907) I saw one in a yard stacked with cement building blocks. It was very tame and let me watch it from a distance of three or four feet.—W. L. BURNETT, *Longmont, Colo.*

Bewick's Wren (*Thryomanes bewickii*) on the Coast of South Carolina.—On October 16, 1907, I saw and positively identified a bird of this species as it rested for about a minute in a live oak tree, which was within sixty feet of a negro house, situated on Oakland plantation, Christ Church Parish, but failed to secure it as it flew into a dense thicket of weeds, briars and bushes. There was no mistake in the identification, as the long fan-shaped tail was diagnostic; besides, it was not the first Bewick's Wren I had ever seen alive, for I found this species in positive abundance at Waukeelah, Florida, in 1894 (see *Auk*, Vol. XII, 1895, p. 367).

My friend Mr. Herbert Ravenel Sass (Assistant at the Charleston Museum), secured a specimen at the Navy Yard (within six miles of Charleston) on October 17. This specimen is the first that has ever been taken in the low coast region of the State, the bird being confined almost exclusively to the Alpine, Piedmont, and upper counties, and rare or entirely absent south of Richmond County, as it delights in a rolling or hilly country.

Mr. Leverett M. Loomis found Bewick's Wren breeding at Caesar's Head (3,118 feet), Greenville County (*Auk*, VIII, 1891, p. 333).—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

A Parasitic Fly Injurious to our Native Birds.—It seems to be well known that in England and on the Continent the nestlings of a number of small birds are not infrequently parasitized by flies, often times with fatal results. It is not so well known that one or more species of these parasitic flies have obtained a foothold in the United States, although

Hough records the presence in this country of two species in 1899 (see Zoolog. Bull., Vol. II, p. 289), stating that they are very rare. I find also that a specimen of one of these species (*Protocalliphora chrysorrhæa*) is in the National Museum from the top of the Las Vegas range, New Mexico, and a second from the White Mountains of New Hampshire, the latter collected by H. K. Morrison, probably about the year 1875.

The subject is not without interest to bird lovers, since during the past summer two successive broods of Bluebirds in Wellesley Hills, Massachusetts, were parasitized by one of the species, and of the eight nestlings only one escaped. The living larvæ and pupæ from the second brood were forwarded to the Bureau of Entomology in Washington and the flies were reared and were identified by Mr. Coquillett as *Protocalliphora chrysorrhæa* Meigen. In appearance this fly so closely resembles a common blue bottle as to be readily mistaken for it. Instead of laying its eggs on carrion, however, this fly lays them more or less frequently on nestling birds, upon the living flesh of which the maggots feed. Truly, sometimes mother Nature seems to be a bit indifferent to the sufferings of her creatures.

How common these flies are in Massachusetts and how extensive their range is in the United States no one seems to know, but it is to be hoped that bird students will bear the matter in mind and report all cases of parasitism coming to their attention. Should they have bird boxes, if they suspect anything wrong with the broods, it will be well to promptly examine the nestlings and destroy the parasites in whatever stage they may happen to be.

Possibly birds that build in boxes or holes, like Swallows, Bluebirds, Woodpeckers, Wrens and others, are more likely to be victimized than those rearing their young in open nests, but the latter sometimes suffer in Europe, and it is highly probable that the young of our Robins, Song Sparrows, and others of our native species also may serve as hosts of this fly. The loss in the two broods noted above was nearly 90 per cent., and if these flies become at all numerous (even now they may be commoner than is suspected) our native birds will be threatened by a new danger.

For the facts in regard to the Bluebirds and for the specimens by means of which the identity of the parasitic fly was determined we are indebted to Mrs. Emma F. Everett, of Wellesley Hills, whose solicitude for the welfare of her Bluebird tenants prompted investigations which led to the discovery of the parasites.—H. W. HENSHAW, *Biological Survey, Washington, D. C.*

RECENT LITERATURE.

Widmann's 'Birds of Missouri.'—Mr. Widmann's 'Catalog of the Birds of Missouri'¹ supplies a much needed list of the birds of that State. As the author states, this is the first attempt at a list for the State of Missouri. "It is based," he informs us, "chiefly on personal observations made during the last thirty years"; but he has also availed himself of the literature bearing on the subject, and of much unpublished information contributed by other observers, whom he mentions in his introduction, including the loan from the Bureau of the Biological Survey of the migration reports on birds of Missouri from 1884 to 1905. With such resources, and Mr. Widmann's well known abilities as an observer and a writer, one is led to expect a thoroughly trustworthy and full report upon the subject in hand, and this volume of nearly 300 pages fully justifies such anticipation.

The twenty pages of introductory matter give a résumé of the literature bearing upon the ornithology of the State; an explanation of the terms used to denote relative abundance; an account of the faunal areas, the climate and topography; remarks on the decrease of birds and the contributing causes; and some good suggestions respecting bird protection. The arrangement and nomenclature of the list is that of the second edition of the A. O. U. Check-List and its supplements. "Synonyms, both scientific and English, used in the works of American ornithologists, principally those used by Wilson, Audubon, Nuttall, Baird, and Coues, are given to enable students to find their way through the many and great changes in nomenclature made since the first of these books was printed ninety-eight years ago,"—merely the names, however, without citation of the authors. "The catalog is confined," the author tells us, "to a detailed treatment of the geographic distribution of each species and subspecies in accordance with the latest sources of information. This is followed by a statement of its range in Missouri, manner of occurrence in regard to season and relative abundance, dates of arrival and departure, and such notes as may be helpful to the student in the search of rare species." Those known to have bred in the State, or whose breeding in the State is "almost certain," are marked with an asterisk. "The catalog contains not only species and subspecies fully authenticated, but also a few of such highly probable occurrence that it seems only a question of time and opportunity to establish the proof of their occurrence." They are not, however, relegated to a 'hypothetical list, since in this way he believes they might be overlooked and escape the attention they deserve. Extirpated and introduced species are also included in due systematic

¹ A Preliminary Catalog of the Birds of Missouri. By Otto Widmann. Trans. Acad. Science of St. Louis, Vol. XVII, No. 1, pp. 1-288. "Issued Nov. 16, 1907." Also separate, without statement of place of publication.

sequence. "The total number of species and subspecies contained in the catalog is 383, of which 162 are breeders. Species not actually taken within the limits of the state are distinguished by being put in brackets. Of this kind there are 30, which subtracted from 383 leave as the present status (July 8, 1907) 353 actually observed species and subspecies for our state."

The manner of occurrence and seasons of migration are stated with fulness, and authorities are cited for the records of the rarer species; the data respecting the former abundance and the extirpation of the Wild Pigeon and Carolina Paroquet are very fully given, as are the notes respecting the great decline in numbers of many other species. Taken as a whole, Mr. Widmann's 'Catalog' as an excellent summary of the ornithology of Missouri, for which his fellow ornithologists may well feel deeply grateful.—J. A. A.

Jones on 'The Development of Nestling Feathers.'¹—"The purpose of this paper," says the author "is to give a more complete account of the development of the down, or Neossoptile, than has been given by previous writers and to show the true relation of this structure to the first definitive feather." This relation is thus stated: "The first down and its succeeding definitive feather are produced by one continuous growth, and therefore cannot be regarded as two distinct feathers. The first down is the plumulaceous tip of the first definitive feather." Contrary to the conclusion of some previous writers, the neossoptile is shown not to possess a shaft nor a true quill, but to be always in direct continuity with the barb-vanes of the first definitive feather. In other words, the neossoptile is only a more or less differentiated distal part of the first teleoptile.

These investigations are based on the study of a large number of species, representing many families, and relate to (1) the development of the nestling down (plates i-iv, and (2) the relation of the down to the first definitive feather (plates v-viii). The first definitive feather with down attached is shown in figures 56-138 (plates v-viii) from a large number of species "by direct prints from the feathers." The paper is thus one of much interest and an important contribution to the subject under investigation.—J. A. A.

Beebe on Geographic Variation in Birds.²—This paper consists of six Parts—(1) Historical; (2) Dichromatism; (3) Sporadic Melanism; (4) Experimental (*Hylocichla* and *Zonotrichia*; (5) Experimental (*Scardafella*).

¹ The Development of Nestling Feathers. By Lynds Jones. Laboratory Bulletin No. 13, Oberlin College, Oberlin, Ohio, 1907. Pp. 1-18, pll. i-viii.

² Geographic Variation in Birds with especial reference to the Effects of Humidity. By C. William Beebe, Curator of Birds, New York Zoological Society.—Zoologica: Scientific Contributions of the New York Zoological Society, Vol. I, No. 1, Sept. 25, 1907. Pp. 1-41, with 5 half-tone plates.

Part I gives a general statement of the conclusions of various authors respecting the influence of climatic conditions upon the coloration of animals, and the results of certain experiments upon a genus of coleopterous insects (*Leptinotarsa*) by Prof. W. L. Tower. Part II recounts certain well known instances of melanism in wild birds and mammals, and other dichromatic phases among birds. Part III enumerates numerous cases of sporadic melanism among cage birds. Parts IV and V deal with Mr. Beebe's own experiments with Wood Thrushes, White-throated Sparrows and Inca Doves.

Mr. Beebe's experiments consisted in confining a specimen of the Wood Thrush, and of the White-throated Sparrow, and several specimens of the Inca Dove, in a superhumid atmosphere and noting the results. The food given these birds was the same as that upon which other specimens of these species were fed, so that this factor is eliminated as a possible cause of the changes observed in coloration. The Wood Thrush showed very little change at the first moult after confinement, but markedly increased change with the second moult, soon after which it died. With the second moult the black spots tipping the feathers of the under parts became much enlarged, with other minor changes in other parts of the plumage.

The White-throated Sparrow, confined under similar conditions, became, after two moults, strongly melanistic, the change affecting nearly all parts of the plumage. The Inca Doves, several of which were subjected to the same conditions, and for longer periods, showed not only a general darkening of the plumage but various other suggestive modifications. In the case of the doves, as in the other birds, there was "a radical change in the pigmentation of the plumage . . . with each succeeding annual moult." *In no instance; however, was there a change of color without moult.*

In the case of the Inca Doves: "When the concentration of the melanin has reached a certain stage, a change in color occurs, from dull dark brown or black to a brilliant iridescent bronze or green. This iridescence reaches its highest development on the wing coverts and inner secondaries, where, in many genera of tropical and subtropical doves, iridescence most often occurs."

In discussing the significance of these changes Mr. Beebe finds reasons for differing from some of the conclusions reached by Prof. C. O. Whitman from the study of various species of doves and pigeons kept in confinement for investigation, under, however, normal atmospheric conditions. In respect to the Inca Doves, says Mr. Beebe: "The increase of pigment in a single individual under humidity during a comparatively short period of time, and the subsequent correlated development of metallic tints, assume a new importance when we consider that, in these experiments at least, mutation and natural selection have no place."

Professor Whitman assumes that "the direction of evolution can never

be reversed," on the basis of his experiments with domestic pigeons. Mr. Beebe found that in placing his Inca Doves (*Scardafella inca*) in an artificially produced tropical atmospheric environment, the same individual passed through, by successive moults, several color phases closely resembling tropical forms of the genus *Scardafella*. Assuming, as it is safe to do, that the genus *Scardafella* is of tropical origin, the characters thus acquired are seemingly atavistic, and that "this humidity induced variation is neither fortuitous nor directionless." These interesting and significant results open up, says the author, "innumerable new vistas of unexplored fields," which we trust he will be able to unfold to us through further experiments with these and other species.

The bearing of all this upon natural selection and ontogenetic species is discussed at some length. Respecting the latter, he considers it would be unreasonable to discard, as has been proposed, species and subspecies "which are ontogenetically interchangeable under experimentation or in a new environment," should such be found. This valuable and suggestive paper closes with a bibliography of the works referred to or directly bearing on the general subject, which we would hold up as an example of 'how not to do it'; not in personal criticism of Mr. Beebe, but of a method all too common in this day of bibliographies, where a thesis or a memoir is counted incomplete unless the author supplies a list of the papers known to him as bearing upon the subject in hand. In many, many instances we find an author cited, so to speak, in general terms,—so vaguely that one is merely guided to the volume, or to the number of a periodical, if he wishes to consult the paper or passage cited, and must hunt out for himself, as best he can, its exact place, at the loss of more or less time and the cost of more or less needless vexation at the author who through slovenliness or indolence is the cause of his trouble.

To cite, in illustration, Mr. Beebe's present attempt at a bibliography:

"FAXON, WALTER. 1886. Another Black Robin. *The Auk*, vol. iii."

"GÜNTHER, A. 1886. Note on the Melanotic Variety of the South African Leopard. *Proc. Zool. Soc. Lond.*, 1886."

"HUMBOLDT, ALEXANDER VON. 1808. *Ansichten der Natur*."

"OGILVIE-GRANT, W. R. 1897. *A Hand-book to the Game-birds*. Vol. ii."

And so on, *ad infinitum*, in this and numberless other modern bibliographies. If a work or paper is worth citing, it should be cited so that the pertinent passages can be found without exasperating loss of time. If one is curious to know what Humboldt had to say in relation to humidity and coloration, or whatever it is that may be referred to, where, under such guidance, are we to find it in a work consisting of several volumes? Or if we wish to know about Mr. Faxon's black robin, or Dr. Günther black variety of the leopard, why should we be compelled to hunt in the indexes under either the name of the author or the animal, or both, to find the information wanted, when the compiler of the bibliography could have given us the page reference with no additional trouble to himself?

Besides, all this has a bad look, prejudicial to the author, who is thus open to the suspicion of lacking literary experience or of being careless and slipshod in his work, either of which suspicions may do him injustice. If an author adds a bibliography to his paper, it is presumably to place his sources of information at the service of others, and not for the purpose of tantalizing or annoying subsequent investigators. The least one has a right to expect is a full and correct citation, giving both the opening and closing pages, if exceeding a page of two in length; while a line or two of pertinent annotation, where required to make clear the bearing of the paper cited, is a boon future investigators along the same lines will recognize with gratitude.

In closing we wish to say again, that Mr. Beebe's present paper is not the cause, but merely the occasion, for this bit of criticism of indolent or slovenly bibliographers, whose number is unfortunately legion.—J. A. A.

Braislin's Birds of Long Island, New York.¹ — Probably no portion of North America of similar area has been the scene of more careful field work in ornithology than Long Island, New York, — a strip of land about 120 miles long by 8 to 18 in breadth, mostly low and little diversified, rarely rising into hills of a 100 feet in altitude along its northern shore. It is separated from the main land on the north by Long Island Sound, and is exposed on its southern front to the broad Atlantic. From the days of Giraud and the elder Lawrence, it has been the favorite resort, not only of gunners in quest of its abundant water-fowl, but of ornithological observers and collectors. A list of some 250 titles appended to Dr. Braislin's paper attests the harvest reaped from this fertile field, exploited so energetically by William Dutcher from 1879 to 1904, and by the author of the present paper during the last decade, and by Dwight, Foster, Chapman, Helm, Howell, the Lawrences, and others at different periods. Dr. Braislin has done well to gather these scattered records into one condensed and consistent whole, citing the dates and authorities for the rarer species, and giving concise statements of the manner of occurrence of the more common ones. The total number of species now recorded is 364; including three introduced species, and various waifs and strays from remote regions, including several from Europe. The list has been most carefully prepared, and its completeness is beyond question. The bibliography is exceptionally well done, the titles and references being fully given, and its value further increased by brief annotations to many of the titles.—J. A. A.

Finley's 'American Birds.'² — Notwithstanding its broad title, Mr.

¹ A List of the Birds of Long Island, New York. By William C. Braislin. Abstr. Proc. Linnæan Society of New York, for the year ending March, 1907, pp. 31-123. Also separate.

² American Birds | studied and photographed | from Life | By | William Lovell Finley | Illustrated from photographs by | Herman T. Bohlman | and the Author | Charles Scribner's Sons | New York 1907 — 8vo, pp. xvi + 256. October, 1907.

Finley's interesting book is limited to about two dozen species of American birds, practically all of them western, with sometimes eastern names. Its scope and character is thus stated by the author: "In this book no attempt has been made to include all the different bird families, but a series of representative birds from the hummingbird to the eagle has been selected. Each chapter represents a close and continued study with camera and notebook at the home of some bird or group of birds,— a true life history of each species. It is the bird as a live creature, its real wild personality and character, that I have tried to portray." The twenty chapters treat of about twenty-five species, each of which is illustrated by a series of excellent photographs of the living bird, its nest, eggs and young, the latter often at several different stages of growth. Although localities and dates are usually omitted, the stories are detailed and pleasantly written, and give a vast amount of information about the ways of life and individualities of the species here so faithfully and sympathetically portrayed and described. There is also entire absence of technicalities in the treatment, which lapses at times into loose statements hardly to be looked for in a book naturally expected to be scientifically accurate as well as popular, in the sense of being non-technical, as where the author tells his readers: "But a list of birds that every one should know could not be complete without our two commonest studies in blue, the Bluebird (*Sialia sialis*) and the Blue Jay (*Cyanocitta cristata*). In all our woods, from the Atlantic to the Pacific, one may find these two, one gentle and friendly, the other bold, boisterous, and untrustful." And this despite the fact that neither of these species is found nearer the Pacific coast than the eastern base of the Rocky Mountains! The "young Blue Jays" shown in the accompanying illustrations are *Aphelocoma californica*, the California Jay, and the Bluebirds are evidently the Western Bluebird, *Sialia mexicana occidentalis*. Such lapses from the truth, whether intentional or otherwise, are apt to leave with the reader who knows better, a rather unpleasant impression.— J. A. A.

Ihering's Birds of Brazil.¹— This is the first of a series of volumes on the Fauna of Brazil, in which will be given a synopsis of the present knowledge of the animals of this great country, to be published by the Museu Paulista. The present volume is an annotated Check-List of the birds, so far as known to the authors, and follows the classification and nomenclature of the British Museum 'Hand-list' and 'Catalogue of Birds.' Although the rule of priority is recognized as mandatory, and the tenth edition of the 'Systema Nat. ræ' of Linnæus (1758) is regarded as the

¹ Catalogos | da | Fauna Brasileira | Editados pelo | Museu Paulista | S. Paulo — Brazil — | Vol. I | As Aves do Brazil. | Pelo Prof. Dr. Hermann von Ihering | Director do Museu Paulista | e | Rodolpho von Ihering | Custos do Museu Paulista | [vignette] Sao Paulo | Typographia do Diario Official | 1907 — 8vo, pp. xxxviii + 485, and 2 maps, + 3 leaves = 2 title pages and contents.

proper starting point of binomial nomenclature, the authors fail sometimes to follow these announced principles through adopting a system of nomenclature beginning with the twelfth edition of Linnæus (1766).

An introduction of some 20 pages contains a sketch of ornithological exploration in Brazil, its faunal regions as indicated by a study of its avifauna, zoögeographical considerations, the preparation of the present catalogue, and questions of nomenclature and terminology, a list of the principal literature, and a systematic index. The two maps show (1) the distribution of forests and campos in South America, and (2) the zoögeographic zones of Brazil and their subdivisions. These are indicated as Fauna amazonica, Fauna do Brazil central, and Fauna do Brazil littoral, each with a subdivision.

The present volume enumerates 400 genera, 1567 species, and 213 subspecies, of which 1102 species are represented in the Museu Paulista by 6984 specimens. The technical name of each species in the Catalogue is followed by a reference to the volume and page of the British Museum 'Catalogue of Birds' where it is described; by its vernacular name; by the citation of references to it, if any, in von Ihering's papers in the 'Revista do Museu Paulista,' and sometimes other references; by a statement of its geographical distribution, in general terms, and by a list of localities represented by specimens in the Museu Paulista. In case of species or subspecies described since the publication of the British Museum Catalogue a reference is given to the place of original description. There are also often brief technical notes on questions of nomenclature and the status and relationship of forms. In the Addenda (pp. 406-423) are further notes on a number of species, with the addition of others described during the printing of the work, etc. An Appendix of fifteen pages contains reprints of descriptions of four species of hummingbirds described by E. J. da Silva Maia in 1843 and 1852. Alphabetic indexes to both the scientific and vernacular names close this important and highly useful volume.—J. A. A.

Beal on Birds as Conservators of the Forest.—In a paper of 40 quarto pages,¹ with 12 colored plates, Professor Beal treats of the utility of birds as protectors of forests. About one half of the text is, as would be expected, devoted to the Woodpeckers, the rest to a varied assortment of birds belonging to a number of families, as Nuthatches, Creepers, Jays, Finches, Warblers, Thrushes, Vireos, Cuckoos, etc. The verdict is reached that birds, particularly tree-inhabiting species, are of decided economic importance. The woodpeckers are ranked as of the highest value as destroyers of injurious tree-infesting insects, since they seek out and destroy the wood-boring larvæ of many noxious species. Other birds search the bark, and others still the leaves, for caterpillars and other insect pests. The

¹ Birds as Conservators of the Forest. By F. E. L. Beal. Rep. New York Forest, Fish and Game Commission, 1902-3, pp. 235-274, with 12 colored plates, by L. A. Fuertes. Published November, 1906.

rôle played by numerous species is distinctly outlined, based on the examination of the contents of their stomachs. The report is made attractive to the general reader not only by the valuable information it contains but by a series of beautiful chromo-lithographic plates, from drawings made by the well-known bird artist Fuertes. The species figured are the Red-headed Woodpecker, adult and young; Northern Hairy Woodpecker, White-backed Three-toed Woodpecker, Flicker, Yellow-bellied Sapsucker, Black-backed Tree-toed Woodpecker, Red-breasted Nuthatch, Blackburnian Warbler, Mourning Warbler, Yellow-billed Cuckoo, Solitary Vireo, Black-capped Chickadee, Brown Creeper, Blue Jay, and American Red Crossbill, all well adapted for striking effects.—J. A. A.

Beal on California Birds in their Relation to the Fruit Industry.¹—This 'Bulletin,' is based on investigations by the writer in California during the fruit seasons of 1901, 1903, and 1906, covering a period of about nineteen months. Dr. C. Hart Merriam, Chief of the Biological Survey, in his 'Letter of Transmittal' to the Secretary of Agriculture, says: "The investigations embodied in this report were undertaken with a view to the accurate determination of the economic status of every species of California bird that inhabits orchards, in order that it may be possible for the fruit raiser to discriminate between friends and foes; and for the added purpose of suggesting remedial measures for the protection of fruit from destructive species." Professor Beal, in summarizing his results, insists "that sound public policy everywhere forbids the destruction of birds on a large scale for the purpose of protecting orchard fruits. Wholesale slaughter of birds in the supposed interest of the orchardist is fortunately rare and often proceeds from a mistaken idea of their economic relations. When it is understood that the damage by certain species is local and exceptional, that the birds in question are on the whole beneficial and that their destruction will be a loss to the State, the farmer and the orchardist are usually willing to adopt less drastic measures in defense of their crops and to spare the birds for the sake of the general weal."

After discussing the causes and general conditions of depredations by birds, the birds that injure fruit in California are passed in review and the evidence bearing on the economic status of each is given in much detail, based on the examination of their stomach contents. The House Finch (*Carpodacus mexicanus frontalis*) is stated to have been the subject of more complaint than all other species of birds together. Yet the examination of over 1200 stomachs shows that fruit is far from being its principal food, which consists mainly of the seeds of weeds, and that a far greater quantity of fruit is eaten by other species, as the Cedar Waxwing and the

¹ Birds of California in Relation to Fruit Industry, Part I. By F. E. L. Beal, Assistant, Biological Survey, U. S. Department of Agriculture. Biological Survey, Bulletin No. 30, 8vo, pp. 100, with a colored frontispiece (California Bush-Tit) and 4 half-tone plates. Issued Nov. 11, 1907.

Robin. The Western Tanager (*Piranga ludoviciana*) becomes occasionally a nuisance in the orchard, but for the most part is a resident of other districts than the fruit growing region. The Swallows, as a group, are exceptionally beneficial birds, subsisting almost wholly, at all times, upon insect food. The Vireos also subsist chiefly upon insects, and are innocent of depredations upon fruit, but they possess a fondness for coccinellid beetles, the enemies of the bark scale and plant lice. The Warblers, as would be expected, come in for unqualified praise as beneficial species, their food being not only almost wholly insectivorous but consisting largely of noxious species. The Wrens, Creepers, Nuthatches and Titmice have also an equally good record; but the Mockingbird and certain of the Thrushes, including the Robin, but not the Bluebirds, partake more or less of fruits; but the verdict, for even the Robin, is that they are far more beneficial than injurious.

This valuable report is illustrated by one colored and three plain plates of as many species of birds, drawn by Fuertes, and one illustrating the seed diet of the House Finch. The evidence here presented should go far to place the smaller birds of California in their true light of benefactors rather than foes of the orchardist and farmer, the debit and credit accounts, presented apparently with great fairness and from positive information, balancing greatly in their favor. — J. A. A.

Howell on the Relation of Birds to the Cotton Boll Weevil.¹ — This is the third report of progress on the investigation of birds in their relation to the rapidly spreading cotton boll weevil pest in Texas and Louisiana. "As a result of investigations carried on intermittently during five seasons 43 species of our native birds have been found to feed on the weevil," some of them in summer, others in winter. The results of these thus far rather limited investigations are given in detail for each species. Of the 86 species studied in this connection, just one half are boll-weevil-eating, and one half are not. But birds have been proved to be so important a check upon the spread of this pest that recommendations are presented for the legal protection of certain weevil-eating species now wholly unprotected in Texas, the erection of nesting boxes for Martins, and the dissemination of information regarding the important aid afforded by birds in holding in check this grave pest. Among the most useful species in this respect are the Flycatchers, Orioles, Blackbirds, certain of the Sparrows and Finches, the Swallows, etc. The report is illustrated with designs for Martin houses, text figures of the Barn Swallow, Kingbird and Crow-Blackbird, and a colored plate of the Baltimore and Orchard Orioles.— J. A. A.

¹ The Relation of Birds to the Cotton Boll Weevil. By Arthur Howell, Assistant Biologist, Biological Survey. U. S. Department of Agriculture, Biological Survey, Bulletin No. 29. Pp. 30, 1 colored plate (frontispiece), and 6 text figures.

Riddle's 'A Study of Fundamental Bars in Feathers.'¹ — This is a study of abnormalities in feathers and their cause. Defects in the development of feathers are not uncommon, and are not confined to particular species, nor to any particular condition of existence, as to birds in a state of domesticity, but apparently occur in all birds. A feather does not present a perfect, uniform continuity from tip to tip, but is made up of an apposed series of faint 'fundamental bars,' and the defects are found to appear at these points of apposition. It is assumed that each segment or 'fundamental bar' represents a day's growth, and also the amount of feather growth between two low blood-pressures. The period of lowest daily blood pressure has been determined as occurring between 1 and 6 A. M. "Since," says the author, "these defective lines are laid down at approximately the same time each day — as is proved by the regularity in the distances separating them — we are forced to the conclusion that the defective *lines* are normally laid down at night, and that a lowering blood-pressure is associated with the production of defective *areas*, and, therefore, of defective lines, for, that the defective line stands for the initial stage of the defective area is as certain as that a defective area has more dimensions than a line." These conclusions are based on experimental and histological research, and appear to have an important economic bearing. The value of the ostrich plume output for South Africa alone is annually depreciated, it is said, to the extent of £250,000 by defective development, which Mr. Riddle traces to malnutrition due to defective diet and other life conditions that it may be possible to remedy. Such researches should also give the final quietus to the belief in 're-pigmentation' and 'rejuvenation' of old, full-grown feathers, which seems to have still a persistent hold upon the minds of certain ornithologists abroad — a relic of former days when feather growth was little understood, and casual observation of external appearances were awarded undue value.— J. A. A.

Hopkins on the Bony Semicircular Canals of Birds.² — The purpose of this investigation was to determine "whether there is any relation of the comparative dimensions of the bony semicircular canals of the ear of birds, either to mode of locomotion, or to genetic affinities." These canals were examined in about 75 species of birds, representing all orders, and all modes of locomotion — running, swimming, diving, flying, and all degrees and modes of flight. The measurements are tabulated. The results show (1) that birds of the most diverse forms of locomotion and very diverse affinities have the same relative sizes of semicircular canals; (2) that

¹ A Study of Fundamental Bars in Feathers. By Oscar Riddle. Biological Bulletin, Vol. XII, No. 3, February, 1907, pp. 165-174.

² On the relative dimensions of the Osseous Semicircular Canals in Birds. By May Agnes Hopkins. Biological Bulletin, Vol. XI, No. 5, October, 1906, pp. 253-264.

allied genera may exhibit great differences in this respect. Hence, the types of canals bear no relation to different modes of locomotion, and have also no taxonomic value. Five different types are described and figured; but "in type 2 occurs *Catharista*, one of the best flyers, and in the same group *Geococcyx*; which seldom flies but is one of the ablest runners." This appears to be the first attempt to investigate the relation of the bony canals in birds' ears to locomotion, or to genetic affinity, and are thus of special interest, since the relative size and structure of these canals has been supposed to have some relation to power and manner of flight. Presumably a knowledge of these structures would be of some use in taxonomy, but it proves to have such importance only within narrow limits.— J. A. A.

A Twenty-five Year Index to 'The Auk' and 'Nuttall Bulletin.'¹ — In November, 1899, the Council of the American Ornithologists' Union appointed a Committee to prepare for publication an Index to 'The Auk' and its predecessor, the 'Bulletin of the Nuttall Ornithological Club,' to cover the twenty-five year period from 1876 to 1900.

The Committee was a large one, and proceeded at once to its work. Each volume was indexed by two persons independently; their work was collated by a third member of the Committee, and verified by Dr. Jonathan Dwight, Jr., the Chairman of the Committee and Editor of the Index. The work was thus very laborious and time-taking, some 34,000 cards having been turned in in duplicate by the indexers to the editor for revision and preparation for the press. This, with unexpected delays in the printing, has deferred the appearance of the volume beyond the anticipated date of publication, but the final results are eminently satisfactory, and form a well-printed volume of nearly 450 pages. As stated by the editor, it forms "a guide to a large part of the ornithological literature of the last quarter of the nineteenth century." The references are classified and arranged in a way to facilitate finding any information required. The titles include papers and works reviewed as well as the papers and notes here first published, arranged in chronological sequence under the names of the authors. Under localities (as States and countries) are entered all geographical references, alphabetically by the names of the authors, followed by citation of volume and page. Species are entered primarily under their respective genera, under their A. U. O. Check-List names, 1895 to 1900, when North American, or their current names in Sharpe's 'Hand-list' or Ridgway's 'Birds of North and Middle America when extralimital, with cross-references to their synonyms. (For index convenience subspecies are treated

¹ Index | to the | Bulletin | of the Nuttall Ornithological Club, Volumes I-VIII — 1876-1883 | and to its continuation | The Auk, Volumes I-XVII — 1884-1900 | Compiled by a Committee of the American Ornithologists' Union | Edited by | Jonathan Dwight, Jr., M. D. | [vignette] New York, | Published by the American Ornithologists' Union | 1907—8vo, pp. viii + 426. Price in paper covers, \$3.25 net; bound in cloth, \$3.75 net. Orders should be addressed to Jonathan Dwight, Jr., Treasurer, 134 West 71st St., New York, N. Y.

as species.) They also are given alphabetically with a cross-reference to the main entry. The species references are classified to indicate the nature of the information conveyed, whether relating to distribution, habits, measurements, migration, moult, nomenclature, plumage, etc. This is secured by the use of special type, and abbreviations preceding the references, etc.

For this admirable piece of work the members of the American Ornithologists' Union and ornithologists at large are indebted primarily and mainly to the labors of Dr. Dwight, who has devoted a vast amount of energy and time to the work, with no other recompense than the consciousness of accomplishing a great and much needed task in an exceptionally satisfactory manner. For we know of no index to scientific literature comparable with this in point of detail and utility. Sets of the publications to which it relates will be incomplete without this index volume, and it will be an invaluable reference book for those who wish to know the contents of the volumes they do not possess.—J. A. A.

'Dan Beard's Animal Book.' — "This book," says the author, "is not a Natural History, neither is it a so styled Nature Book.¹ It is simply a book of animals and is made up from the Author's personal notes and sketches made in the fields and forests for his own amusement and not with a view to publication; . . . " "This book," he says again, "was not written for scientific reasons or even for profit. As the boys would say, it was written 'for the fun of it,' or as their parents might say, it was written 'for the love of it!'" This is evident from every page, and it is for this reason all the more interesting, both the illustrations and the text. It is replete with humor, with original information about our native mammals, birds, newts, frogs and toads, lizards, etc., by a born artist, a humorist, and a devoted lover of nature. As to the motive, "If this book succeeds in awakening a love for wild Nature in even a small portion of the American youth it will be counted as a success. Well barbered and manicured Nature, closely shaven lawns and neatly trimmed hedges are perfectly proper in yards to suburban houses, but contact with Nature without a hair-cut and unshaven is what gives strength to one's muscles, brightness to one's eyes, and makes the red blood dance in one's veins." "What we need and what is coming is an unselfish, passionate love of Nature, not for Nature's sake, but for humanity's sake; such a love is wholesome, manly, invigorating and uplifting."

The last fifty pages relate wholly to birds, and the last chapter (pp. 510-538) is interestingly ornithological, with many apt original renderings of bird songs, and field notes.—J. A. A.

¹ Dan Beard's | Animal Book | and Camp-fire Stories. | By | Dan Beard | Author of "The American Boys' Handy Book," "Jack of all Trades," etc. | Illustrated by the Author | New York | Moffat, Yard and Company | 1907—8vo, pp. vii + 538, with over 100 illustrations (plates and text figures, several of the former colored). Price \$1.60.

Annual Report of the National Association of Audubon Societies for 1907.¹—As usual, the annual report of the President of the National Association of Audubon Societies, Mr. William Dutcher, is an important document, ornithologically as well as from the standpoint of bird protection. It consists of four parts, the Report of the President (pp. 285-300), in which he gives a general summary of the work of the year, with recommendations for future lines of action; the Report of the Secretary (pp. 300-303), in reference to his own personal work in the South and elsewhere as an official representative of the Association. Reports of Special Agents (pp. 303-327),—of Edward Howe Forbush on his work in the New England States; of H. H. Kopman, in the Gulf States; of William L. Finley, in Oregon and Washington; of John B. Watson, on the condition of the Noddy and Sooty Tern Colony on Bird Key, Tortugas, Florida; of A. C. Bent, on the condition of bird colonies on Cobb's Island, Va.; of Arthur H. Norton, on the protected bird colonies of the coast of Maine. The Reports of State Societies (pp. 328-361), in alphabetic sequence, relate to the work done by local societies in 30 States and the District of Columbia. Then follow a list of Members and Contributors, and the Treasurer's report.

The President, in his summary of 'Results Achieved' during the year thus refers to the subject of animal refuges or reservations: "One of the most important results secured by this Association since its organization has been the large number of reservations set aside as bird refuges and breeding homes by President Roosevelt. During the present year six have been added, all of which are the ancestral homes of birds, and they will, in the future, be under the direct supervision of the United States Department of Agriculture. It is our function to investigate and discover bird-breeding islands, rocks and keys; the locality and number and species of birds is reported to the Department of the Interior, at Washington, and, if the property still belongs to the Federal Government, an order is prepared for the signature of the Chief Executive. This Society then selects a suitable person to act as a guard, who is recommended for appointment as warden. He is then officially commissioned by the Department of Agriculture at a nominal salary, which is supplemented by additional compensation from this Association....

"The plan of bird and animal refuges is destined to be a great factor in the future in the preservation of the wild life of the country. However good the laws are and however well they may be enforced, killing will go on, and there should therefore be refuges established in all parts of the country where shooting is absolutely prohibited. It is astonishing how soon birds and animals learn to know where they are undisturbed, and how little fear of man they display within such bounds. The reservations we are securing are the beginning of the plan of refuges, but the Federal Government owns no land in any of the thirteen original States, nor does it

¹Bird Lore, Vol. IX, 1907, pp. 285-372, with full page half-tone plates and text illustrations.

own any in Texas. In these fourteen States, the proposed system of refuges can be secured only by purchase, or by a legislative act.

"It is very much to the credit of the authorities in Pennsylvania that the game-refuge plan has been adopted. The authorities of New York should adopt the plan at once, and establish a large number of bird and game refuges in the Adirondack and Catskill Parks. The setting aside of land for a refuge does not necessarily mean that it cannot be occupied by man, it simply means that when a bird or animal reaches these sacred precincts its life is safe.

"The refuge plan must necessarily in the future be largely by purchase or lease or donation from individuals or societies. The Louisiana Audubon Society has been very active in this work, and now owns or leases a large number of islands....

"Thousands of memorial dollars are contributed annually to educational or philanthropic institutions. We suggest that a beautiful and appropriate memorial would be an island or tract of land dedicated in perpetuity as a bird refuge in charge of this Association. It would be a lasting and fitting monument."

Besides the important work of searching out the breeding resorts of wild birds on the keys and islets of the Gulf of Mexico, of the southern Atlantic coast, and of the coast of Oregon and Washington, and elsewhere, and securing their permanent reservation as protected breeding resorts of species that would otherwise soon disappear, much effort is expended in securing better legislation for the protection of birds, and in defending from repeal that which has already been obtained; in educational work in publishing and sending out hundreds of thousands of specially prepared leaflets; in warden work, and in aiding and guiding the work of local societies.

Although the Association has a large endowment, its income is far short of its needs, which, as its work broadens, necessarily steadily increase. The work already accomplished in the short period of its existence is astonishing; the activities of its President, his resourcefulness in discovering new lines of usefulness, his promptness in action in cases of emergency, and his unselfish devotion to the great cause he has thus far so successfully promoted, are a sufficient warrant for a most urgent appeal that his hands be further strengthened by additional financial aid for the work that must necessarily devolve upon the Association from year to year as its work advances. The provision for wardens for the rapidly increasing number of reservations is alone a strong draft upon its resources, which fact should appeal to the philanthropically disposed who have means at their command for the aid of a work of the highest importance to the welfare of man, both economically and esthetically.—J. A. A.

NOTES AND NEWS.

HOWARD SAUNDERS, an Honorary Fellow of the American Ornithologists' Union, died at his home in London, after a long and painful illness, October 20, 1907, at the age of 72 years.

From Mr. W. R. Ogilvie-Grant's appreciative biographical notice of Mr. Saunders, published in the November issue of 'The Zoölogist' (Fourth Ser., Vol. XI, No. 131, Nov. 15, 1907, pp. 436-438) we take the following:

"Mr. Saunders was born in London in 1835, and was educated at Dr. Gavin Smith's school at Rottingdean, where at an early age he displayed a special interest in birds, and made his first recorded observation. Born of an old and honourable merchant family of the City of London, he received during his early years a business training, which may be traced in his accurate and methodical manner of dealing with any subject he undertook. All his writings bear testimony of the same careful and painstaking treatment, and it is not too much to say that his 'Manual of British Birds,' which is perhaps the best and most widely appreciated of his works, will always remain a model of accuracy and learning compressed into the smallest possible bulk....

"At the age of twenty Mr. Saunders left England in the clipper-ship 'Atrevida,' bound for South America, and his observations on the Albatrosses noted during the voyage were published in a letter to the 'Ibis' for 1866. During 1855 to 1856 he visited Brazil, Chile, and Peru, and remained in the latter country till 1860, his time being chiefly spent in antiquarian researches, and in acquiring a perfect knowledge of the Spanish language. Subsequently he made a remarkable journey across the Andes to the head-waters of the Amazon, and descended that river to Para. Thence he returned to England, where he devoted the greater part of his time to the study of ornithology. Between the years 1863 and 1870 he paid frequent visits to Spain, his proficiency in Spanish being of great use to him during his travels. The results of his observations on the birds of the Spanish peninsula were published in a series of articles which he contributed to the 'Ibis,' 1869-1872.... In 1870 he was elected a member of the British Ornithologists' Union, and took a leading part in its conduct, being still Secretary at the time of his death. He was twice Editor of the 'Ibis,' from 1883-1886, and again from 1895-1900. From 1880-1885 he was Honorary Secretary to Section D of the British Association for the Advancement of Science. He was a Fellow of the Zoological, Linnean, and Royal Geographical Societies, and served on the Councils of all of them, and from time to time contributed valuable papers to their 'Proceedings.' He was also a member of the Société Zoologique de France, Honorary Member of the American Ornithologists' Union, and of various other European societies....

"His ornithological writings were noted for their excellence rather

than for their number, for Mr. Saunders was by no means a voluminous writer. In 1882 he took over from the late Professor Newton the editorship of the fourth edition of Yarrell's 'British Birds,' and in the most admirable manner re-wrote the third and fourth volumes which were still required to complete the edition. Subsequently he conceived the idea of writing his greatest work, the 'Manual of British Birds,' mentioned above, which was published in 1899, and passed through a second edition ten years later. On this subject we have already touched, as also on his monograph of the Gulls [Laridæ, in Vol. XXV, 'Catalogue of the Birds in the British Museum']. On these latter, to the study of which he had devoted the greater part of his life, he was undoubtedly the greatest authority in the world, and he possessed a remarkably fine collection of their skins, which was acquired by the Trustees of the British Museum in 1894. He presented to the nation his fine collection of eggs of Gulls and Terns, and, from time to time, numbers of skins of birds from Southern Spain and other parts of the world.

"He was always ready to place at the disposal of others his great store of information, and a large number of books written by his friends passed through his hands for revision. He was a man of singularly sound judgment, and possessed of a wonderful sense of proportion, consequently his help and sympathy in both public and private difficulties were constantly sought and invariably forthcoming. The loss of such a man and such a friend has plunged the little community of British ornithologists into heartfelt sorrow."

Mr. Saunders, with Dr. P. L. Sclater, attended the second annual meeting of the American Ornithologists' Union, held in New York City, September 30 and following days, 1884, at which meeting Mr. Saunders was elected an Honorary Member of the A. O. U. He also visited Cambridge and other scientific centers in America, and the acquaintance thus formed with the leading American ornithologists ripened into lasting friendships. In recent years the notices of 'The Auk' appearing in 'The Ibis' have come from his pen. His American colleagues who have visited him at his London home will recognize the justness of Mr. Grant's tribute to his memory.

RUDOLPH BLASIUS, a Corresponding Fellow of the American Ornithologists' Union, died at his home in Braunschweig, Germany, after a long illness, on September 21, 1907. An account of his life and ornithological work will be given in a later number of this journal.

MRS. ISABEL PADDOCK CARTER, an Associate of the American Ornithologists' Union, died quite suddenly in St. Johnsbury, Vt., Sept. 15, 1907, a fortnight after her marriage to Edgar N. Carter. She was born in the home where she died, March 19, 1871, and was the only surviving child of Harolin and Mary Hawes Paddock. After an academic course and a year or more in music at Smith College she gave instruction in instrumental

music at the Academy in St. Johnsbury, and for a time was curator of the Museum in her native town. Mrs. Carter was an active member of the Vermont Bird Club and of the Botanical Club of her State. Proficiency in music made it possible for her to do much original work in scoring the songs of wild birds, and Chapman in his 'Warblers of North America' makes frequent acknowledgment of help received from her in this line.—J. H. S.

MRS. JACOB L. SWEIGER, an Associate of the American Ornithologists' Union, died in Waterbury, Conn., March 24, 1907, in the 47th year of her age. She was born in Waterbury, May 13, 1860, and was the daughter of Joseph Shelton and Sarah (Denman) Bronson. The family removed to Watertown, Conn., shortly afterwards, where were spent Mrs. Sweiger's childhood and young womanhood. After her marriage she returned to Waterbury and resided in that city until her death. She was an active member of the Naturalist Club of Waterbury, contributing frequently and materially to the work of that flourishing organization. Mrs. Sweiger was an enthusiastic lover of birds, and her sunny, cheerful disposition won for her a host of friends.—J. H. S.

THE COUNCIL of the American Ornithologists' Union, at a meeting held in Philadelphia November 9, 1907, unanimously adopted the new Article 30 of the International Code of Zoölogical Nomenclature (see Auk, Vol. XXIV, Oct. 1907, pp. 464-466 for the full text of the article) as a part of the Revised A. O. U. Code, soon to appear, and instructed the Committee on Nomenclature and Classification of North American Birds to make such changes in the present draft of the Code as were necessary to bring it into harmony with said Article 30. It also provided that in case any differences of opinion should arise in the Committee in respect to the interpretation or application of the Article as applied to particular cases, such points of difference should be referred to the International Zoölogical Commission for decision, and the decisions of the Commission to be accepted as final. As the Zoölogical Commission has signified its willingness to act as an Arbitration Commission on moot points of nomenclature, the way seems now open for the adjustment of any cases where experts may reach different conclusions. It is to be hoped that other scientific bodies which have to deal officially with questions of zoölogical nomenclature will emulate the example of the American Ornithologists' Union.

AN IMPORTANT illustrated work soon to appear in five quarterly parts is 'A Monograph of the Petrels (Order Tubinares),' by F. DuCane Godman, D. C. L., F. R. S., President of the British Ornithologists' Union. The edition will be limited to 225 numbered copies, in large quarto, illustrated with 105 hand-colored plates, drawn by J. G. Keulemans. The work will comprise all of the known species of Petrels, Shearwaters, and Albatrosses,

over one hundred in number. The first part is announced to appear in December, 1907, and the other parts during the year 1908. The publishers are Witherby & Co., 326 High Holborn, London. Subscription price, £2 5s. per part, or £10 10s. for the whole work if paid for in advance.

A BOOK on the 'Hawks of North America' is in preparation by Prof. Lynds Jones and Rev. W. F. Heninger, of Oberlin, Ohio. "Although scientific in character, special stress will be put upon the diagnostic marks for the field student." Each species will be illustrated by photographs of head, tail, wing, and claws. Contributions on habits, distribution, etc., from bird students throughout America, especially on the rarer species, will be greatly appreciated and due credit given for them by the authors.

'THE Home-life of some Marsh-Birds,' photographed and described by Emma L. Turner, F. L. S., and P. H. Bahr, B. A., M. B. O. U., is announced by Witherby & Co., 326 High Holborn, London. It will contain 32 full-page plates, 64 pages of letterpress, descriptive of the points of interest, and many text illustrations. Demy 8vo, price, 2s. 6d. net.

A WORK on the 'Birds of Britain,' by J. Lewis Bonhote, M. A., F. L. S., F. Z. S., is announced by Adam and Charles Black, Soho Square, London, to be illustrated by 100 full-page illustrations in color selected by H. E. Dresser from his 'Birds of Europe,' of which they are to be facsimile reproductions. Price 20s. net (post free 20/6). The volume is written in popular style by a well-known ornithologist, and will have a complete account of every species one is likely to meet with in Great Britain.

THE twelfth annual meeting of the Maine Ornithological Society was held in the rooms of the Portland Society of Natural History, Elm St., Portland, Maine, Nov. 29-30, 1907. The officers present were: President, Prof. Leslie A. Lee, Brunswick; Secretary-Treasurer, J. Merton Swain, Farmington; Editor, W. H. Brownson, Portland; Councillor, Capt. H. L. Spinney, Bath; Councilor, Prof. Ora W. Knight, Bangor. There were about twenty-five other active members present, and two corresponding members, Hon. Thos. J. Emery, of the Harvard Law School, and Sherman E. Phillips of Canterbury, N. H. The officers, as given above, were reelected for the third term.

The next annual meeting will probably be held in Brunswick, the Friday and Saturday following Thanksgiving, 1908. Many scientific papers and talks were listened to with a great deal of interest. Among them were the following: 'The Terns of Bluff Island,' by W. H. Brownson; 'The Decrease of Eagles in The Kennebec Valley,' by Capt. H. L. Spinney (for fourteen years Keeper of Seguin Island Light); 'The Economic Value of Birds,' by Prof. E. F. Hitchings (Entomologist to the Department of Agriculture of Maine; 'Destruction of Birds during a Severe Storm in April, 1907,' by Miss Marshall; 'Birds observed along the Highway,' by J. Merton

Swain; 'Bird Migration in Maine,' by O. W. Knight; 'The Feathers of Birds,' (illustrated), by Arthur H. Morton. Many other shorter notes were given by other members.

A Public Meeting was held Friday evening, when a very enthusiastic audience listened to the three illustrated lectures: 'The Birds about Portland,' by W. H. Brownson; 'The Birds about a Light-house,' by Capt. H. L. Spinney; 'The Birds along the Eastern Coast,' by Prof. O. W. Knight.

A committee was chosen to send resolutions to the members of Congress, from Maine relative to the appropriations and continuance of the U. S. Biological Survey.

Ten new members were elected, and the Society is in a prosperous condition. The members are very enthusiastic for the future of the Society.—J. MERTON SWAIN, *Secretary*.

THE THIRD annual meeting of the National Association of Audubon Societies was held October 29, in the American Museum of Natural History, New York City. Members were present from Massachusetts, Connecticut, New York, New Jersey and North Carolina.

The treasurer's report showed that the income of the Society during the year had been \$17,978.53 and that the expenditures were \$26,843.43, making a deficit of \$8,864.90. This condition arose from the fact that legislative expenses were very heavy during the past year, and it was also necessary to help several of the State Societies to carry on their local work. Further, the Society received only six months' interest on its endowment fund, as none of the investments of the Society were made early enough in the year to permit it to receive a full year's interest.

The Society now holds mortgages amounting to \$316,000 on six pieces of New York City property. Each title is guaranteed by a Title Guarantee Company. None of the loans exceeds two-thirds of the appraised value; the said values being certified to by the most conservative and well-known appraisers in New York City. All of the loans pay 5 per cent interest and are non-taxable.

The President gave a synopsis of what had been accomplished during the year 1907, and outlined some of the plans for 1908. For details of his report, together with the reports of the State Audubon Societies and other matters of interest, readers are referred to the complete report which follows in this number of BIRD-LORE. After December 15, members of the Association can receive separates of the annual report and financial statement on application at the office, 141 Broadway, New York City.

The following Directors were elected to serve for a period of five years, being the class of 1912: Mr. F. M. Chapman, New York; Mr. Witmer Stone, Pennsylvania; Dr. Hermon C. Bumpus, New York; Mr. Frederic A. Lucas, Brooklyn; Mr. Carlton D. Howe, Vermont.

A resolution approving the work of the United States Bureau of Bio-

logical Survey, and calling upon Congress to amplify the work of the said Bureau, was unanimously passed, and it was further resolved that the secretary send a copy of the resolutions to every member of the next Congress.

Subsequently a meeting of the Directors of the Society was held, when the following officers were elected to serve for one year: President, William Dutcher; First Vice-president, John E. Thayer; Second Vice-president, Dr. T. S. Palmer; Secretary, T. Gilbert Pearson; Treasurer, Frank M. Chapman. Mr. Samuel T. Carter, Jr., was reappointed counsel for the Society.

The President appointed the following Standing Committees: Executive Committee — Dr. J. A. Allen, Dr. George Bird Grinnell, Mr. F. A. Lucas, Mr. F. M. Chapman.

Finance Committee — Dr. Hermon C. Bumpus, Mr. John E. Thayer, Mrs. C. Grant LaFarge, Mr. F. M. Chapman.— T. GILBERT PEARSON, *Secretary*.¹

IN THE November-December issue of 'Bird-Lore' (Vol. IX, 1907, pp. 249-255) is an article of special interest on 'The Heath Hen, a Sketch of a Bird now on the Verge of Extinction,' by George W. Field, chairman of the Massachusetts Commission on Game and Fisheries. The Heath Hen "was formerly distributed from Cape Ann to Virginia, and was especially abundant in Massachusetts, Rhode Island, Connecticut, Long Island and New Jersey." It was exterminated in Massachusetts and Long Island, and probably over the intervening district, by about 1840, but is known to have survived in New Jersey till 1869. Since this date its last stand has been on the island of Martha's Vineyard, off the coast of Massachusetts, where the area it inhabits has become restricted to about thirty square miles, and its numbers reduced to about one hundred individuals. This article is illustrated by photographs showing the home of the Heath Hen, its nest and eggs, and the Heath Hen Group in the American Museum of Natural History.

In the same number of 'Bird-Lore' (p. 283), is a note on 'The Protection of the Heath Hen,' which shows that an effort is being made to raise money for the purchase of land for a reservation for it on Martha's Vineyard, toward which the sum of \$2338 is already pledged. It is hoped "that sufficient funds may be raised to secure extensive tracts as refuges for the Heath Hen, Least Tern, Upland Plover and other birds which still resort to this island." Every dollar contributed for the purchase of land will add, it is said, at least one acre to the proposed reservation. Contributions may be forwarded to the Commissioners on Fisheries and Game, State House, Boston, Mass.

¹ From Bird-Lore, Vol. IX, 1907, pp. 282, 283.

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Annals of Scottish Nat. Hist., No. 64, Oct. 1907.

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Bulletin of the Charleston Museum, Vol. III, Nos. 5-7, Oct.-Dec., 1907.

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THE ECOLOGICAL SUCCESSION OF BIRDS.

BY CHARLES C. ADAMS.

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"Of all truths relating to phenomena, the most valuable to us are those which relate to their order of succession. On a knowledge of these is founded every reasonable anticipation of future facts, and whatever power we possess of influencing those facts to our advantage."—JOHN STUART MILL.

"Indeed, some geologists seem to take pride in lack of knowledge of principles and of their failure to explain the facts observed in the terms of

the elementary sciences. I have heard a man say: 'I observe the facts as I find them, unprejudiced by any theory.' I regard this statement as not only condemning the work of the man, but the position as an impossible one. . . . The geologist must select the facts which he regards of sufficient note to record and describe. But such selection implies theories of their importance and significance. In a given case the problem is therefore reduced to selecting the facts for record, with a broad and deep comprehension of the principles involved, a definite understanding of the rules of the game, an appreciation of what is probable and what is not probable; or else making mere random observations. All agree that the latter alternative is worse than useless, and therefore the only training which can make a geologist safe, even in his observations, is to equip him with such a knowledge of the principles concerned as will make his observations of value."—PRESIDENT C. R. VAN HISE.

I. INTRODUCTION.

Almost every observer of animals has noted that certain kinds of birds are usually found associated in certain conditions, as, for example particular species of sandpipers and plovers upon the sandy beach, or the Meadowlark and Dickcissel upon certain prairies; but this is rarely considered a subject worthy of serious scientific study. To discuss the significance and value of such ecological study and suggest phases for investigation is the object of this paper. By the ecological distribution of birds is meant that correlation between environmental conditions and the occurrence and association of certain species of birds. In such study special attention must be devoted to the places of breeding; nevertheless the associations of birds at all seasons of the year are of importance. It is not the isolated occurrence of these species, but their relative abundance, the association of certain species, and their persistent occurrence in such conditions which is significant. In the literature of ornithology there is a vast amount of isolated data bearing on this subject, but very little of it has been organized and systematically studied.

When once the facts and general ecological relations have been determined, so that the representative bird associations or societies of given localities have been correlated with their proper environments, it will then be possible to determine how one society becomes transformed into another, whether this is due primarily to other birds

or to other environmental influences. A knowledge of the succession of bird societies and of the laws of change will not only lead to new ideas as to the influence of the environment, but will also have a marked influence upon the practical field studies of the bird student. It should lead to a more intelligent understanding of the relation of birds to the world about them, or even better, to the world of which they form a part.

Attention should further be directed to the fact that simply the occurrence of the bird in a definite habitat is not by any means the sole aim of such work. The influence of the environment should be studied in its bearing upon all phases of bird life. Not only should the most favorable habitat or optimum be recognized, but also the influence of the less favorable conditions; thus the nesting site, composition of the nest material, food, abundance, feeding grounds, migrating habits and all like relations are needed for an adequate and exhaustive study of the ecological distribution and succession of birds.

It is therefore not surprising that such requirements will be difficult to meet because the facts themselves are difficult to secure. Then there are further difficulties which are due to the limitations of the student himself, and are psychological in their nature. As examples of this class of difficulties two may be cited, because they are of frequent occurrence in all kinds of scientific work and not by any means confined to the study of birds. For, contrary to our youthful ideas, naturalists have the same limitations as humanity in general! We may divide naturalists into two classes, depending upon their primary type of mind. First, those who tend to see only the infinite detail of isolated facts and observations. This type of mind is particularly impressed with the multiplicity and variety in nature, and is one to which a general statement is almost a cause of irritation because there are usually exceptions to any general statement. The constructive imagination seems feebly developed in this type. To this class belong many extremely valuable and useful students, because of the data which they, often with extreme conscientiousness, collect. They are collectors of facts rather than students of relations. To the second class belongs that type of mind whose primary interest is in generalizations, principles, relations, and which tends to neglect isolated facts and

observations. The constructive imagination is liable to be developed in this type. This includes many extremely valuable and useful students on account of their tendency to condense, sift and formulate great masses of isolated facts. They are students of ideas and relations rather than collectors of "facts."

Each class, especially the well-marked types and extremes, often finds it difficult or impossible to understand the point of view of the other class. This frequently leads to misunderstandings and often to mutual contempt. Cope and Marsh clearly illustrate these two types of minds among our American naturalists.

By this time some may wonder why this subject has been introduced. It has been with a definite purpose, because frequently these opposed points of view cause delays in the development of many subjects. Thus a forewarning to students of bird ecology may produce good results if the individual student makes a conscious effort to counterbalance such deficiencies as go with his particular type of mind. In the past, details have tended to produce confusion through the neglect of general ideas. It is rarely that a word of warning on this subject is out of place, because the balanced "golden mean" investigator is never too abundant. The quotations at the head of this article have an immediate bearing upon the subject at this point.

Not only is habitat preference, the association of avian species, their succession, and the laws expressing these relations of much interest, but they are of much importance scientifically as well as in a practical way. It is therefore desirable that naturalists realize the necessity of understanding the "rules of the game" if the true relations of birds are to be studied to the best advantage. No adequate substitute has yet been devised to replace a grasp of general principles.

Throughout this paper emphasis is placed on the *definiteness* of the dominant major environmental influences and complexes because the irregular features have apparently received undue emphasis and have retarded the recognition of certain important definite relations.

II. REPRESENTATIVE LITERATURE ON HABITATS AND SUCCESSION.

1. *Habitat Preference.* The American literature on habitat preference and succession, as a subject of special investigation, is very limited. By succession is meant the change or replacement at a given place of one or several species (an association) by others; as when a swamp is invaded by a dune and the representative swamp birds are replaced by those of the dune; or even again when the dune becomes fixed by vegetation and is inhabited by still another association of bird life. This is a much neglected subject; however, isolated observations on habitats are abundant in the biographies of the various species. The fragmentary character of these biographies tends to make them composite and they lose what peculiarities they may have which are due to a response on the part of the bird to its particular conditions of life. These unfortunate limitations clearly show that here is an extensive field worthy of careful investigation. The work already done will be a useful guide in many cases, but the student who wishes to develop this subject must turn to the fields and forests rather than to the literature, both for his inspiration and his data.

Perhaps a further word should be added concerning the limitations of the *composite* life-history method, as this will aid in making clear the kind of work needed in the future. This composite or generalized method of describing habitats and life histories and the response of birds to them, tends to lay undue emphasis upon the *average* conditions of life and habits, and tends to neglect those *detailed responses* to the environment which reflect the laws of local influence. These results are similar to those produced by systematic students who are "lumpers" and who do not recognize local races or varieties. Thus a nest may be built upon the ground at the base of a shrub or bunch of grass, or in the brush, but what conditions determine such sites? In a dry meadow a Song Sparrow may build directly upon the ground, but in a swamp, in order to have a dry nesting site, it builds in a willow shrub. In many cases the causes of these differences will be difficult to determine, but in others it is a relatively simple question for any one familiar with the species to solve. There are also geographic variations of habits

as well as those of habitats just cited, and for this reason it is necessary not to confuse such variations with those confined to some restricted area. These local and geographic relations are very intimately related, but they are subjects which can only be worked out in detail when local studies give proper attention to local environmental responses.

In the following account of the literature no attempt is made at completeness, but the papers cited are believed to be representative. These papers will help to give some idea of the kind of observations and records already made, and will be suggestive as to future work. Mention will first be made of the literature on habitat preference, and then of that on succession.

By far the best discussion we have found on habitat preference of the birds of a given region is that by Townsend ('05) on Essex County, Massachusetts. The primary avian environments are described, the representative birds listed, and their preferred habitats are briefly discussed. Thus, the ocean and its birds, the sand beach and its birds, the sand dunes and their birds, the salt marshes and their birds, and the fresh marshes and their birds, give a general idea of the subjects treated. Regarding the birds of the sand beaches, he remarks: "Among the Plover, the Black-bellied, Semipalmated, and Piping Plovers are above all birds of the beach, although the first two are occasionally found in the marshes, while the last-named rarely strays from the beach and the adjoining sand dunes. The Golden Plover, although at times found on the wet sands, is much more likely to hunt for food on the dry sands above the highest tides, or still farther inland, while the Killdeer generally avoids the beach altogether, preferring the fields" (p. 21). And regarding the birds of the sand dunes he remarks: "Savanna Sparrows nest in numbers at the foot of clumps of tall beach grass throughout the dunes, and on the edges of the tidal inlets from the marsh. The nests of the Red-winged Blackbirds and the Bronzed Grackles are abundant in the bogs and groves of the birches. The Crow, in the absence of tall trees, builds perforce in the stunted pines and birches, at times only ten or twelve feet from the ground" (p. 34). In the case of the Crow, note that he records the response to the dune environment.

While Townsend recognizes changes in the environment, as in the

dunes and beach (pp. 21, 30), yet he does not see their relation to the bird life in the definite way in which he sees their habitat preferences, nor does he appear to clearly recognize the fundamental relation of association within the breeding habitat. To him the environment is static. However an excellent feature of his work is the record of seasonal changes in the bird life of the various habitats. In this connection attention should be called to certain papers which will greatly aid in the study of the dynamics or changing environmental factors which influence sea or lake shores bordered by dunes and swamps; conditions represented on the Massachusetts coast. Gilbert ('85) has discussed the general principles and topographic features of lake shores; and Gulliver ('99) the shore line of the sea. But in addition to these physiographic forces, the vegetation also has a dominating influence upon bird life. For general principles relating to this subject Cowles ('01) should be consulted for his discussion of the vegetation of inland shores and dunes, and Ganong ('03 and '06) for his treatment of the Atlantic coastal conditions. These authors discuss the succession of the vegetation, a factor of the utmost importance in the study of avian succession.

While considering Townsend's results, it may be well to outline briefly a general succession of bird life along the shore as indicated by his records. It is evident from the map accompanying his volume that the currents and waves are constantly modifying the coast line and forming spits, bars and islands; and that the barrier beach area is increasing, and thus tending to become continuous at the expense of some of the ocean habitat. As the continuity of the beach develops, the area of swamp land behind it tends to increase and thus to further restrict the open water and increase the swamp habitat. The beach sands, once free from the waves or ground water, are caught up by the winds to form dunes, and may migrate into the swamps and thus transform them. Thus with the extension of the beach the sea birds are replaced in dominance by the shore birds, and a succession is produced.

In a similar manner the dunes encroach upon the swamp, and swamp birds are succeeded by those of the dunes. As the wandering dunes become anchored by vegetation and forests grow upon them, still other birds will invade them. Thus all stages may be expected,

from ocean to beach birds, onward to those characteristic of wandering and fixed forested dunes. These relations are outlined simply to indicate the problem and its causes, which need detailed investigation.

In Michigan a few habitat studies have been made. One in the Porcupine Mountains, on the south shore of Lake Superior, and another on Isle Royale. Both are by McCreary; the paper on the latter area is unpublished. The summer birds of the Porcupine Mountains are listed (McCreary '06) by selected localities and the habitat preferences are discussed as follows: water birds, birds frequenting the shores and banks of streams, birds frequenting grassy meadows and alders, birds frequenting tamarack and cedar swamps, birds frequenting hemlocks and maples, and birds frequenting the cliff and mountain top. In its emphasis upon habitat preference this paper is the only one so far seen which at all approaches Townsend's discussion of this subject. McCreary's work was done without a knowledge of Townsend's.

In southeastern Michigan, Brown ('06) made a locality study and outlines the habitats as follows: birds found in orchards, birds of the open woods, birds of the open fields, birds of the thicket, and birds of the marshes and river. Brown's paper is intermediate in character between the preceding papers and those of an economic nature, to be mentioned later, because the area studied has been so much influenced by man.

There are a few papers which, although primarily faunistic or geographic, contain habitat data. Such, for example, is Ridgway's ('74) discussion of the birds of the Wabash Valley and ('89) the birds of the Illinois prairie (pp. 13-16). An exceptionally good paper of this character on the Louisiana birds is by Beyer, Allison and Kopman ('06), although its aim and method of treatment differs from that of Townsend. The bird life is, however, closely correlated with the vegetation and the physical conditions of the State.

The papers previously mentioned have been written from a regional standpoint. The study however of all the various conditions frequented by a given species or some natural group is also an important and neglected method of ecological study which possesses certain important advantages. As an illustration of this method may be mentioned Palmer's ('00) study of the Maryland

Yellow-throat. He has shown that different varieties have different habitat preferences. Jacobs ('04) has given us an interesting habitat study of a single species in Pennsylvania, the Golden-winged Warbler.

Let us now turn to another class of habitat studies, those which through man's influence throw only a subordinate light upon "natural" habitats and succession, and are primarily of economic importance but contain valuable habitat data.

An interesting and rather unique paper belonging to this class, based on observations in Southeastern Michigan, is by Watkins ('00). It is entitled 'Michigan Birds that Nest in Open Meadows.' A few of his statements explain his point of view: "To make more plain the limit and scope of this treatise, which, of necessity must be longer than I hoped, I will include in my list only such species as I have found nesting upon the ground in the open fields and meadows, excluding those found nesting upon the boundary fences or ground; also those nesting in the open marsh lands which are undrained and boggy to the extent of being unfit for hay or pasture" (p. 67). The paper contains numerous notes on the habitat preference and variations in these traits.

By far the most comprehensive and thorough study of any limited farm area is that by Judd ('02) of a farm in Maryland. In this paper habitat preferences are clearly recognized, and discussed rather fully (pp. 12-20). The birds are associated thus:—birds that nest in open fields, birds that depend on covers, birds of less limited distribution (consists largely of remarks on haunts), and birds of varied distribution. His last two sections are rather miscellaneous in character and show that the principles of classification for habitats were not clearly defined in his own mind.

The only other paper discussing habitat preference in detail is also the latest upon the subject, and is by Forbes ('07). This is a preliminary report on a bird census across the corn belt of Central Illinois in the early autumn; a study of the feeding grounds and preferences as influenced by the dominant crops of the area traversed, corn, pasture, and stubble. By means of this census, the habitat preferences for different crops and the association of species in them is statistically determined. The paper is particularly suggestive for its bearing on the subject of dominance; however,

the suggested method of study has even greater significance when applied during the breeding season. Doubtless opinions will vary as to the validity of the method as applied by Forbes, even by those who would approve of it for the detailed study of a limited area, or a breeding habitat. For large areas some coöperative method may be necessary.

2. *Succession.* Turning now to the literature on succession, it is found to be extremely limited in amount. So far as known to the writer, only two American authors seem to have realized the existence of succession. In his discussion of the biotic succession in the Porcupine Mountains of Michigan, Ruthven ('06) clearly included the birds, although they did not receive separate treatment, and might for this reason be overlooked. His position is clearly stated (p. 43) as follows: "Owing to the dependence of forms of life on their environment, biotic changes are necessarily closely related to environmental changes. These biotic changes may occur in two ways; the forms must either be able to respond to the new conditions, or be supplemented by other forms. That they tend to become adjusted cannot be questioned, but in many cases at least, this adjustment lags behind the changing conditions, and the forms are replaced by others from adjacent habitats which are adjusted to the conditions toward which the particular habitat is changing, thus bringing about a succession of societies." In speaking of the biota of the hard-wood forest he further says: "This region has been reserved for the last, for the conditions are evidently those toward which the other habitats tend to be changed under the present conditions. . . . This society thus represents the climax society of the region. It consists of the forms that are adapted to or associated with the conditions which prevail in this region in the last stages of the mutual adjustment of all the environmental processes. As the processes become adjusted to one another, the habitat of the climax society is increased at the expense of the other habitats, and the associated biota tends to become of general geographic extent in the region."

The only other paper discussing avian succession is that by Frothingham ('06), and this is not a "natural" succession but one influenced primarily by man. He clearly expresses a bird succession correlated with the reforestation of burned lands. The area

studied is the Michigan forest reserve on Higgins Lake. The region was originally covered with White and Norway pine, but repeated fires first kill off the pines, later the oak and maple; and finally the dominant vegetation is sedge, sweet fern, huckleberry and prairie willow. With the fire protection afforded by the reserve, Frothingham anticipates a reversal of the above succession of destruction, and further remarks: "With the types of vegetation which mark the different stages of the plant succession just described there seem to be correlated certain definite bird forms. These forms are for the most part such as frequent observations in northern Michigan have identified as generally characteristic of the respective environments." This is followed by lists of birds characteristic of different kinds of vegetation. While these lists do not correlate perfectly with the implied succession, yet the general statement of the problem is clearly expressed.

The burning of forests has long been known to change the character of the vegetation and fauna of areas, but this is often referred to as the change of a "life zone." Thus Merriam ('99, p. 47) states that a fire in the Canadian zone on Mt. Shasta is followed by the Transition zone and remarks: "But in the meantime a new growth of Shasta firs has started, and in ten or twenty years is likely to overtop and drown out the Transition zone species, enabling the Canadian zone to reclaim the burn. . . . But on the steeper slopes, especially rock slopes, if the vegetable layer is burned off, the (lower) zone which creeps up to replace the (higher) one destroyed becomes permanent or nearly so. . . . Deforestation of an area therefore tends to lower its zone position." Birds are not mentioned in this discussion nor the relation of "zones" to the general problem of succession. Such "zones" are thus only particular phases of succession.

It is thus seen from the above outline of literature that habitat preferences have been outlined for a few widely separated localities and for some agricultural conditions, but there has been no comprehensive discussion of the problems of habitats and succession, even in a preliminary manner, either from a scientific or economic standpoint. This fact seems rather remarkable in view of the great utility of a knowledge of the general principles underlying economic practice. There are, however, certain phases of biotic

succession which have been discussed by a few authors. These subjects have either been discussed in a very general manner or are detailed discussions of special regions or groups of plants and animals. For this reason, perhaps, their bearing upon other groups than those specifically mentioned are very likely to be overlooked by those who take little interest in any subject or discussion which does not specifically mention their specialty or locality. This phase is mentioned in order to show that while avian successions have been considerably neglected, advances have been made elsewhere, by means of which some general principles appear to have been fairly well established. This is particularly true of plant succession, as shown by the writings of Cowles ('01), and in considerable detail by Clements ('05). The discussion by Clements will be particularly valuable to the student of avian succession.

III. THE MAJOR AVIAN ENVIRONMENTS.

As has been seen in the preceding review of the literature on haunts, no comprehensive discussion has been given of the environmental influences or ecological distribution of (extra-tropical) North American birds. Various authors have discussed their geographic distribution, and certain geographic variations have been referred to certain environmental influences, but a general ecologic treatment, as contrasted with a primarily faunistic one, has not been made. This is remarkable when we recall the fact that the collections of North American birds are, considering the large area concerned, the best in the world both as to quality and as to quantity (Stejneger, '03). This means that there have been many trained collectors; but what has become of the notes and observations on the environments and conditions of life of these birds, which must necessarily have been known to successful collectors? Part of these observations have been published, and perhaps no one is to blame because more have not; but the point of significance is that we have, in fact, hardly made a beginning in the careful detailed study of the bird environment and its development as a distinct field of study. In common with the remainder of the North American biota, several general principles are known, but they do not appear to be current among ornithologists.

The following discussion and suggestions on the larger environmental units attempt only an outline of certain phases of the problem, in order to call attention to certain principles which seem useful as a background for the intelligent study of bird habitats and succession. From such a standpoint as this, the *dominant* influences of given areas and environments are of particular interest and of fundamental value. By focussing attention upon the importance of recognizing these dominant environmental influences, we may hope to escape some of the confusion which appals those who are keenly impressed with the chaos and complexity of the problem. These dominant factors are usually not single isolated forces, but resultants of several or many influences. Thus, as in the case of the vegetation, it is not one factor, but a complex, which influences different birds in different ways. Nevertheless there is what may be called a mass or dominant effect.

A major habitat unit may be considered as a combination of conditions which are dominant in a certain area. *The very dominance means that a relatively limited number of forces or complexes are operative.* With departure from such a center of influence the dominance changes, as other influences are encountered and other dominants are established.

When we consider that certain ecological groups of birds are world-wide in their environmental relations, it becomes evident that such characters are of fundamental importance. Thus water birds may occur in any part of the world where water is a dominant environmental factor. This is not a simple ecological group of birds, but one of the greater units of association which may be subdivided into many minor classes; as those which frequent the sea, and others the inland bodies of water. The shore birds form another natural ecological group, and also the inland birds a third. There may thus be considered to be three primary ecological groups of birds which are closely correlated with definite and dominant environmental influences; thus:—

1. Water birds.

Those frequenting the sea and the adjacent rocks on which they nest, and inland waters.

2. Shore and Marsh birds.

Those frequenting shores of all kinds, seas, lakes, swamps and rivers.

3. Inland birds.

Those frequenting deserts, grass lands and forests.

Of course these ecological classes are not sharply defined, and yet they are so distinct that they can be easily recognized. It should be noted that the above groups are closely correlated with certain dominant physical features of the earth — the sea, the shore and the inland environments.

The relative abundance and dominance of these classes of birds will be determined largely by the dominance of such physical conditions as most distinctly favor a particular ecological group. Thus at sea the water birds are dominant; on shore, the shore birds; and inland, still other kinds. The linear character of the shore habitat and the adjacent breeding grounds gives it a rather unique character, as the two other habitats occupy large expanses. However, the swampy, somewhat shore-like conditions of the far north most nearly approach, for the shore birds, the expansive character so usual for water bodies and inland areas.

In the present discussion the emphasis placed upon the inland vegetation does not mean that the dominance of other influences is not recognized, but simply that it makes a convenient and fairly reliable *index to many other environmental influences*, as, for example, the climate and topography. A further important advantage of the plant index is that the science of plant ecology and many of its general principles and methods are applicable to birds. A general knowledge of plant ecology is therefore becoming one of the most valuable tools in the hands of the field ornithologist. Every field naturalist has observed the general correlation of certain birds with certain kinds of vegetation. This relation is clearly expressed by Ridgway ('89, p. 8) as follows: "There is probably no better index or key to the distribution of birds in any country than that afforded by the character of the vegetation; should this vary essentially within a given area, a corresponding difference in the bird-life is a certainty." This phase of the subject clearly illustrates the oft-repeated experience of naturalists that in order to thoroughly understand one subject — perhaps the favorite one — it becomes necessary to study another, or even several. Thus in order to know the bird life of a region it has become necessary to study the ecological relations of its vegetation.

The study of ecological plant geography is an extensive one, but many of the details, so important to the botanist, are of much less concern to the ornithologist, who needs primarily to know the major plant associations or formations and their successional relations. This implies ability to recognize dominance among plant species and the general method of transformation from the dominance of one to that of another.

By a plant formation is meant that association of species (or plant society) which is correlated with those conditions which tend to prevail over a large geographic area in the last stages of mutual adjustment of all environmental and biotic processes. Such an association or formation tends to occupy such an area to the exclusion of all others, and is thus a climax society.

But absolute dominance of a formation does not occur, because local conditions break the monotony where streams, water basins, bare rock, and similar influences may interrupt the desert, grassland or forest, and produce minor habitats and associations of both plants and animals.

It is not my purpose to discuss in detail the various plant formations of (extra-tropical) North America, but to outline those which are of evident ornithological utility. The following may be recognized provisionally:—

1. The Arid Deserts of Southwestern U. S. and the Mexican Plateau.
2. The Grasslands of the Great Plains.
3. The Deciduous Hardwood Forest of Southeastern U. S.
4. The Coniferous Forests of Eastern Canada.
5. The Giant Conifer Forest of the Pacific Coast and the Rocky Mountains.
6. The Barren Grounds or Cold Desert.
7. The Alpine Deserts.

A mere inspection of this list of avian and vegetational formations shows that the recognition of these large environments is relatively simple. It is also seen that they represent fairly definite physical or environmental complexes of such fundamental importance that there can be no doubt as to their general validity. As to the relative value, influence, boundaries, and the dynamic relations of these formations, much is already known, but not as an organized body of facts and principles. It will also be noted that these regions do

not closely correspond with current faunal areas, although there is a very close correlation in some cases. An avian formation may, in general terms, be considered the analogue of a vegetational formation, although this does not imply that they necessarily have the same boundaries.

As the literature treating of the vegetation of these areas is extensive and scattered, a few papers will be cited as an index to others:—

1. Arid Deserts; Bray, '06; Coville and MacDougal, '03.
2. Grasslands or Plains; Clements, '05; Pound and Clements, '00.
3. Southeastern Hardwoods; Cowles, '01; Harper, '06; Transeau, '05.
4. Eastern Canadian Conifers; Whitford, '01; Transeau, '03, '05-'06; Ganong, '03, '06; Harvey, '03.
5. Rocky Mountain and Pacific Conifers; Whitford, '05; Gray and Hooker, '81; Piper, '06; Young, '07.
6. Alpine; Merriam, '90, '99; Coville, '93; Fernald, '07.

These environmental unit areas as found to-day, are the result of many successions which, in some cases at least, reach rather far back into the past. This is because some occupy ancient land areas, such as much of the Southeastern Hardwood area. On the other hand, some occupy relatively new regions, that is, at least with regard to the dominant factors now in control, as in the glaciated part of North America and on the Coastal Plain. So far as the present is concerned such relations clearly show that these areas are only the end results of extensive past changes or successions which represent the terminal branches and cross sections of development. It is to the study of such regions and associations that we must turn for the fundamental organization or associational relations of the various elements which compose not only the environments but also the associations of animals.

In order to make as definite as possible the *structural and ecological characteristics* of these formations, certain general relations are here formulated. Throughout this paper it should be remembered that the individual birds and associations of given areas form the units of comparison. Such a distinction is necessary because many species show considerable geographic variation in habits and in the habitats frequented. The writer clearly recognizes the risks and difficulties of such an attempt. They are deliberately put in their present form to *invite criticism and qualification* from

field workers. It is desirable to know the validity of these formations, their internal ecological relations and dynamic tendencies, their relation to dominant environmental influences, etc. A complete list is not attempted, and some of the statements may be only fragments of larger generalizations; but it is just such relations as these which will develop if the entire subject is considered critically and synthetically. Some of the leading characteristics of these larger environmental units and their avian *formations* may be briefly outlined as follows:—

1. The dominance of a limited number of physical conditions or complexes, as climate, topography, vegetation, animals, etc., in a given area produces the primary environmental units and formations.

2. Secondary environmental dominance is shown by a secondary avian association. Thus in the Northeastern biotic center there is a secondary dominance due to water basins in the forest area.

3. A formation or climax society is composed of a relatively (and usually absolutely) limited number of species which are dominant in a given environment of geographic extent. Such dominance, in general, implies extensive range, relative abundance, and ability to indefinitely succeed or perpetuate itself under given conditions.

4. Where dominance obtains, avian variety is limited so that the greatest diversity occurs where local influences prevail, and at the margins of the formation.

5. Correlated environmental and biotic dominance produces what may be considered a *biotic base*, stratum, or optimum, from which departures may be considered less favorable. This is a relative equilibrium, resulting from complete environmental and biotic adjustment, under given conditions.

6. In each formation there is a normal inter-adjustment of the avian species and individuals, in addition to the adjustment with the dominant physical environment. The former is dominated by their structure, habits, and instincts or behavior; hence the colonial breeding or spacing, migration, etc.

7. Each large environmental area or formation tends to have a full complement or set of species, of diverse but supplementary ecological character, such as water, shore or inland birds. One set is likely to be dominant.

8. Relative stability in an association is correlated with the climax dominance, and generally with extreme and slowly changing local influences. Fluctuation is correlated with intermediate conditions.

9. Diversified associations and isolation are greatest with imperfect dominance, but dominance itself produces isolation of the climax association. This diversification produces associations surrounded by others and hence their isolation.

10. The taxonomic elements in different formations vary much, but there are close analogies in the kinds of taxonomic and ecological groups in different formations,— as the Mniotiltidæ of the New are represented by the Sylviidæ of the Old World. Cf. Osborn, '02. Le Conte, '50, p. 239*. Cf. No. 7.

11. The roughly zonal arrangement of societies about the climax society (= formation) or the environmental optimum, is primarily due either to local reversals, the lagging influence of local or neutral conditions, or to the influence of adjacent formations. This is a result of the retardation of the complete cycle of successions.

12. The primary environmental conditions tend to encroach upon all others. The local conditions thus tend to become transformed in the direction of the dominant environment and to be appropriated by it. The corresponding avian associations are thus given a definite dynamic trend.

13. The mobility of birds during the breeding season is very generally overestimated. The presence of the nest and young renders them for a time relatively sedentary. There are many causes influencing this, such as other individuals, proximity of food for young, homing, instinct etc. 7

IV. MINOR AVIAN ENVIRONMENTS AND THEIR ASSOCIATIONS.

We have seen that the larger geographic environments or formations are characterized by definite conditions and associations, and at the same time that even throughout these favorable regions the climax association is not distributed with absolute uniformity

because of local variations in the physical features, such as vegetation, water basins, streams, mountains, etc. For the student of local bird life the real work begins when one attempts to examine into the causes and influences exerted by these conditions which break the monotony of the formation and make possible a diversified avifauna. But birds do not always respond as closely to slight local influences as does the vegetation, and for this reason one must learn by experience just what size of units must be used. Thus in the forest a few wind-falls will attract but little attention, but a burn of a few acres will have a noticeable influence in harboring those species of birds which frequent openings; while swifts and swallows ignore many local influences which dominate other species.

It should also be noted that whenever possible it is of distinct advantage to examine all habitats in their original state, uninfluenced by man.

Instead of discussing the leading features of local conditions and their societies or associations in detail, only an outline of them will be given, and that in a form to facilitate use and revision.

1. Minor environments are primarily dependent upon local conditions, and are thus in a sense correspondingly independent of the dominant forces of the region. This is, of course, a relative condition.

2. Minor environments are, as a rule, relatively limited in area. In general their limited area favors their short duration, but age is primarily a result of the rate of change.

3. Marked isolation, even when of extensive linear extent,—as a shore line, along a stream, or an elongate rocky ridge,—is also characteristic of minor environments.

4. Minor environments tend to become encroached upon by the dominant regional influences and ultimately to become extinct. The succession of societies in local habitats is a declining one, while that of the geographic or climax habitat is an increasing and ascending one.

5. Local habitats produce most of the variety within the dominant area, and make possible a diversified avifauna. The structural differentiation within a formation (zones, etc.) is thus largely, in addition to variations in the formation itself, of local origin.

6. Local associations or societies, in general, furnish the essen-

tial clues as to the earlier successions which have attended the evolution or development of regional dominance. The variations in these are due both to the kind of life and to the influence of adjacent associations and centers of dominance.

7. Marginal societies are particularly liable to variation in composition, due to the combined influences of adjacent formations or centers of dominance as well as to local conditions.

8. Comparative studies of local habitats will form the most general and practical guide in the determination of the successions in the formation.

9. Local habitats and societies, in common with the larger environmental complexes, are characterized by the dominance of few physical and biotic factors, and by a limited number of species.

V. AVIAN SUCCESSION.

1. *General Remarks.* Since the breeding grounds are of fundamental importance in the ecology of birds, the study of them in such situations furnishes the greatest source of insight into their life relations. By an avian association, formation or society is meant different combinations of species which *regularly occur together in the same breeding habitat* or area. These breeding grounds must be considered broadly, and include not only the nesting site but also the feeding grounds, even when they are physically very different, because ecologically these conditions form a unit during the breeding season.

It is well known that when a given set of physical conditions are dominant, as in a dense conifer forest, a swamp or an extensive orchard, relatively few individuals and kinds of breeding birds are characteristic of such conditions, except in the case of those nesting in colonies. The field relations of these colonial and isolated breeders are quite different. It is also of importance to recall that abundance is a relative term, with a very different meaning in the case of seed-eating and predaceous species.

Bearing in mind these conditions, bird succession means a change from the dominance of certain species or associations to that of others. Thus in the beginning a slight change in abundance of a

species may be noted, with a corresponding decrease in another; and this proportion may continue to change until the intruder becomes dominant and the rival form may disappear entirely. This process of change, as a rule, is not limited to a single species, but usually involves several or all of the members of the association, as when a dune invades a swamp and the swamp birds are completely replaced by those frequenting the sand dunes.

2. *Succession on Isle Royale.* With these preliminary considerations in mind, we will turn to the ecological succession of bird life upon Isle Royale, Lake Superior. The field work upon the island was carried on by a party from the University Museum of the University of Michigan, under the direction of the writer. Aside from succession, the general ecological relations of the birds were studied by Otto McCreary and Max M. Peet, and elsewhere detailed descriptions of the region and detailed notes will be published. The writer has based his main records of habitat preference upon their work. For this outline of succession only the primary features of the location need be given.

In the present treatment an attempt will be made to follow the genetic succession, at least in its broader outlines. Various qualifications and reservations have been made, and others will follow, so it is hoped that no confusion will be produced by this method of treatment.

Geographically, Isle Royale, Michigan, is an island in Lake Superior, near the North Shore, not far from Port Arthur, Ontario. The *topography* forms a part of an ancient peneplain of moderate relief, glaciated and with an abundance of elongated low ridges and valleys with numerous water basins. The *soil*, which is locally absent, is generally humic or mixed in character, bordering and in the depressions; but is mineral, stony and residual elsewhere. The combined shore and beaches are extensive, largely stony and gravelly, and contain but little sand; much of the shore line is rocky and precipitous; many outlying islands. *Vegetation*, herbaceous in shallow inland waters and as a ground cover except where the shade is too dense, and upon rocks; shrubs on protected beaches, in more open places in the forest and in burns; the forest consists of Tamarack, Black Spruce and Arbor Vitæ in bogs; and elsewhere in mesophytic conditions of Balsam Fir, Arbor Vitæ,

White and Yellow Birch, and rarely Sugar Maple. Upon the dry ridges, Jack Pine; and in burned areas, Aspen and Paper Birch. *Climate*, seasonal changes very pronounced; winters very long and cold, and summers short and cool; a relative humidity of about 80% in December and of about 70% in July (*cf.* Johnson, '07); a mean temperature for January of 7.97° F.; and for July, 62.24° F. (Port Arthur data). Early, deep snows. *Predaceous animals*, as the Lynx, Marten, weasels, Red Squirrel and bats are directly in competition with the birds for food, or prey upon the birds.

The above environmental factors are dominant features and give us a general picture of the conditions, largely in terms of common experience. In the life of the birds, however, a complete reassortment and change of intensity in these factors occurs when they are combined as habitats. The surrounding lake, the numerous bays, small lakes and ponds compose the aquatic habitat and make it a characteristic feature. The very irregular and extensive shore line and limited beach area characterize the coastal border, while inland, excepting the main bodies of the few larger lakes, the encroachment of the bog vegetation upon the shores is such as to prevent an extensive development of sandy open beaches. The above mentioned habitats are open unforested areas; the remainder of the island, with the exceptions of the bare rocky ridges, the clearings and burned over areas, are forested. Very extensive swamp forests abound in the elongate valleys and the borders of the water bodies, and are composed of Tamarack, Black Spruce and Arbor Vitæ. The mesophytic forest occurs on drained areas and is characterized by Balsam Fir, White Spruce and Paper Birch; the burned areas by second growths of aspens and Paper Birch. Then there are also influences which are exerted upon the bird life in general, as for example, migration. In this case, undoubtedly both external conditions and the habits and the behavior must be correlated. Another general and dominant influence should be reiterated here, and that is that all open areas tend to become invaded with vegetation and finally forested, whether they are lakes, ponds, bogs, rock openings on the ridges, burns or clearings. The mesophytic Balsam-spruce forest tends to monopolize *all* habitats, and gives a definiteness to all succession upon the island.

From a genetic standpoint the past and present dominance of the

surrounding Lake must be recognized. This formerly stood at a level much above that of the highest ridges upon the island, as is clearly evidenced by the abandoned beaches on the north shore of Lake Superior. Such relations prove that Isle Royale was once a rocky reef in the lake, which, as the Lake level was lowered (it is quite unlikely that the island has been materially elevated) became exposed as a wave-washed beach. These conditions are approximated to-day by the low outlying islands. The beach or shore is thus the *original* habitat upon Isle Royale, and in general, all others have been derived or developed from it. To discuss these as a truly genetic series would require that these be described *simultaneously*, as the differentiation took place. These habitats did not develop as isolated phenomena, but several developed at the same time, or abreast. Thus as soon as enough of the land surface had become exposed so that its inequalities began to have an influence, the ridges would be the parts best drained, and certain depressions would tend to accumulate the drainage. This process would lead to a simultaneous development or differentiation of the well, moderately, and poorly drained habitats. Almost all of the residual soil formed as the region was baseleveled was probably cleared away by the glaciers; or later, as the waves fell from the island, by the pounding of the waves. Thus the relative absence of a soil must characterize all habitats. At what period life first reached the island in post-Glacial time is not definitely known; but it is likely that the pioneer vegetation of lichens, mosses and low herbaceous vegetation reached it soon after its *exposure*. If the biota reached the island about the time of the formation of the Algonquin beach, which, roughly speaking, may have been at about the present elevation of 475 feet above the Lake surface, it has since spread upward and downward from that level. The composition of the initial societies is not liable to as much variation as the later ones. Thus if the Herring Gulls returned to the region at this early period of the exposure, they were probably the pioneer birds; but if only at a much later date, still other species might have accompanied them. While such variations as this may be expected, and due allowance must be made for them, yet there can be little reasonable doubt but that *water birds* and those frequenting *open places* tended to become the pioneers, and that later, with the development of a soil and forests, other associations of birds became established.

There are at least five important factors which enter into the composition of the past and present conditions which have moulded and are even now moulding the formation of the habitats upon Isle Royale. These five are:—*first*, past climatic changes; *second*, the local topography; *third*, the falling lake surface; *fourth*, dynamic tendency of the vegetation; and *fifth*, the habits and structure of the birds. With these guiding principles, let us now turn to certain details of the resultant succession.

a. The Aquatic Association and Habitat.

The expanse of Lake Superior, the irregular shore line producing coves, the inland water bodies and streams, together furnish an extensive and expansive area of habitat. The cutting of the Lake waves encroaches upon the land habitat, and the deposition by them elsewhere causes minor extensions of the land habitat (as at Rock Harbor where a sand spit furnishes a nesting site for a Kingfisher). Inland the encroachment of the vegetation tends to restrict the water areas, as the falling Lake level has, in the past, tended to increase the land habitat. These processes must be recognized in order to grasp the dynamic tendencies of the habitat.

The *characteristic* aquatic society is composed of the Herring Gull, Loon, American and Hooded Mergansers, and the Pied-billed Grebe; mainly fish eaters and scavengers. Other species, of greater inland tendencies, are attracted by the fish food, as the Eagle, Osprey and the Kingfisher. The Gulls show a decided preference for the great Lake, and the Loon for the inland waters. The presence of the Kingfisher was influenced by the harbor with its attendant sand banks and bars. As all these water bodies near Isle Royale freeze over in winter, the strictly aquatic birds must normally migrate to secure food. Of course none of these birds nest in the open waters, but on the island beaches (Gulls), near the mouths of streams, and inland in marshy places; but all, as a rule, nest near the water. The very young soon attend their parents, and are thus in the water at an age when many land birds are yet helpless in the nest, thus confirming their aquatic habits and habitat. During migrations many other species frequent this habitat.

Where Isle Royale now is, once rolled the open Lake; and it is

not improbable that as the island appeared the Herring Gull was one of the first species to discover it. Such a bird might even reach the island under climatic conditions of the Ice Age, for the species now ranges far north along the shore of the Arctic Sea. A species of such extensive chronological and geographical range will tend to give much stability to succession. The present breeding range of the Mergansers and the Loon is not so far north, and for this reason they may have arrived under milder climatic conditions. But if the island became exposed under mild post-Glacial conditions, all of these species may have arrived at much the same time. But even with the chances for such variations the general succession seems to have been initiated with the aquatic association as the pioneer society.

In following the genesis of the habitats and associations from this point onward, divergence and differentiation becomes so marked that it is impossible to develop all lines abreast. A linear treatment becomes necessary, and therefore certain general relations are liable to become obscured unless specifically mentioned in advance.

The aquatic and beach habitats possess a marked tendency toward a zonal arrangement. From the Superior beach the transition is through open or shrub zones into the climax forest. The topography of the island with its longitudinal ridges and valleys form a dominant factor in impressing this zonal structure upon the biotic associations. This series,—from the water, through the beach, open and shrub marginal zone, into the climax forest,—may be considered as the genetic vegetative succession. They change simultaneously and are due to the same general cause,—the falling Lake surface, which transforms the water area into beach, the beach into forest margin, and forest margin into the climax association. But as mentioned, it is manifestly impossible to discuss all these transitions at once, and each ecological unit must therefore receive separate genetic treatment.

This tension line or marginal zone between the Lake and the forest shows such a wonderful diversity and complexity in its conditions, that several plant and animal associations are formed within

this zone. With its onward march there are simultaneous changes in several associations which, while they will vary in their changes, yet all tend to converge in harmony with the dominant factors. These conditions migrate or radiate from the highest land. On the other hand, the inland marginal zones, which border the smaller water bodies, migrate inwardly; and being closed areas, tend to become extinct. This marginal zone, particularly beyond the upper beach, forms one of the most interesting and complex conditions found upon the island. It is not an ecological unit, but is composed of several of them. This is where most of the confusion arises in actual field work of habitat studies.

b. The Shore and Marsh Association and Habitat.

As the area of the islands expanded and the shore line was lengthened, the habitat for shore birds increased; but the steep and rocky shores were unfavorable for the development of beaches because loose rock, as tools for the waves, was limited in amount. The local character of the shingle and gravel to-day found in the various coves clearly indicates their local origin; and much the same conditions have obtained in the past. On account of these conditions, the sandy beaches are very conspicuously absent. The dynamic tendencies of the beach are those which cause the extension or restriction of the aquatic and beach habitats, supplemented by the drift which is tossed upon the shore. Where there is shallow water, and mud accumulates, favorable conditions are furnished for invertebrate food for birds. Inland, the numerous lakes, ponds and marshes furnish shore conditions which tend to become extinct through drainage or overgrowth of the vegetation, except in those parts of the larger lakes where wave action tends to scatter such accumulations as rapidly as formed, or to prevent its formation altogether.

Although observations on this subject are quite limited, yet it seems fairly safe to consider the Spotted and Solitary Sandpipers as characteristic birds of this association. Upon such a rocky coast, sandy and gravelly beaches are quite exceptional and are confined to protected coves. Additional diversity is produced where small streams enter these coves and produce deltas.

Little is gained by sharply segregating the marsh and shore birds, although the marsh birds show a preference for conditions better represented or correlated with topographically older coasts, protected and inland conditions. Attention should be directed, however, to the significant fact that successions initiated with such diversity will produce a variation in the composition of the associations. Also that so far as possible these variations should be considered comparatively and synthetically in reconstructing and anticipating successions.

The American Bittern, Lesser Yellow-legs, Swamp Sparrow and Marsh Hawk belong to this society of marsh birds. As in the case of the aquatic association, these birds generally nest in close proximity or entirely within these shore or marsh conditions. Still other species frequent this belt to feed, as it is an open area; but their presence is mainly conditioned by the adjacent shrubs or forest. The very limited number of species in the aquatic and shore associations is worthy of particular mention.

The Yellow-legs, Spotted Sandpiper, Bittern and Marsh Hawk range far to the north, even to the Barren Grounds, and thus suggest chances, as in the case of the aquatic association, of an early arrival and succession upon the island.

With the growth of the island, there has been a corresponding extension of the outer and inner shore habitats, although the encroaching vegetation has had a marked tendency to restrict the area of the inland habitat. The dominant environmental influences in this habitat appear to be, 1, the physical character of the shore and beaches; 2, the dynamic forces of the water bodies and streams; 3, the encroachment of the vegetation; 4, the downward migration of the shore; and 5, the habits and structure of the birds.

As a general rule, we may say that the beach of the outer lake tends to be succeeded by either the bog or upland associations, and those inland by the bog association.

c. Bog-forest Association and Habitat.

As just stated the outer coast or an inland one may develop into a marsh or bog habitat or association. In the bog, the Tamarack, Black Spruce and Arbor Vitæ are the pioneer trees in transforming

the open marsh into a forested one; while upon the outer shore the alders and aspens tend to precede the conifers as a general rule. From the bog forest the transition to the Balsam-White Spruce forest may be perfectly continuous, and thus there will be a series characterized by the dominant conifers. In places *Arbor Vitæ* may form the dominant swamp forest, but this is only a variation in the conifer dominance. With improved drainage or the accumulation of vegetable debris, these habitats become converted into the Balsam-spruce climax forest and hence the environmental dynamic tendency.

As the forest encroaches upon the open bogs the Tamarack, Black Spruce, *Arbor Vitæ*, *Cassandra*, Labrador Tea and alders are accompanied by birds characteristic of this early stage; such as the Red-breasted Nuthatch, Yellow-bellied Flycatcher, Golden-crowned Kinglet, Cedar Waxwing, Chickadee, Canada Jay, White-winged Crossbill. Where alders abound the conditions are favorable for the Redstart and the White-throated Sparrow. But later, as the bog conifer forest becomes continuous and dominant, the Waxwing, Redstart and White-throated Sparrows diminish in numbers and finally disappear. Still later, as the swamp becomes eliminated with the development of the climax forest, the Yellow-bellied Flycatcher will also become excluded.

This is perhaps the simplest succession from the water to the climax forest, via the bog forest. This series is very perfectly preserved in all stages and has an extensive range. The number of species in the association is rather large when compared with the preceding associations.

d. Aspen-birch Association and Habitat.

This series develops from the beach as the waves fall from the ridges or low rock surfaces and leave the bare expanses. As the rock disintegrates, decomposes, and humus accumulates, a soil is formed, mainly in depressions or at the bases of the ridges, and from these it tends to encroach upon the open places with a zone of Jack Pine, aspens, or White Birches. These areas are largely strips along the crests of ridges or small park-like openings on rather level rock. In no case are these single areas large, so that the

habitat is only extensive in the aggregate. With the presence of the open aspen and birch woods, the following society is likely to be characteristic:—Junco, Oven Bird, Red-eyed Vireo, Chipping Sparrow, White-throated Sparrow, Flicker, Cedar Waxwing, Wilson's Thrush and the Chickadee. As the deciduous trees are replaced by the open encroaching conifer forest, the Song Sparrow, the Nashville, Myrtle and Black-throated Green Warblers and Wilson's and Olive-backed Thrushes, which frequent the forest margins, increase in abundance. The Oven Bird has an extensive northern range from Labrador into the Yukon Valley and may well have been a very early pioneer upon the island as the aspens and birches were probably the first broad-leaved tree arrivals. From the above it is seen that this means an extensive variety, but as the dominance of the climax forest encroaches this number again becomes reduced.

The composition of the society varies somewhat, depending upon the surroundings, as proximity of the present shore or distance from it. Many of these openings are continuous with the present beach. It is not improbable that this was a prominent society whenever the waters fell rapidly from the island between rather stationary levels. This has been a society decidedly on the decline with the encroachment of the forest.

Probably this association varies considerably in its composition, and has done so in the past; but its main features are fairly constant. These variations seem likely, through the influence of openings produced by fires which, when extensive, may have caused a new equilibrium among those species frequenting openings.

The Burned Area Association.

This phase should perhaps be considered as supplementary to the aspen-birch association just considered. A fire brings about a reversal of conditions through the destruction of the forest, and in some cases, a part of the soil as well. As there are all degrees of extent and completeness in this process, there is a corresponding variation in the details of the resulting succession, at least in its early stages. It is only when there is a very complete destruction of the vegetation that the continuity with former occupancy is wholly broken.

The easily inflammable character of these conifers, even when in a green condition, makes it likely that natural causes, such as lightning or marsh gas (*cf.* Penhallow, '07), may have been influential. The proximity of the gas supply and the conifers is of interest as this may influence their liability to fire and thus to this sort of reversal of conditions. Thus liability to fires is rather characteristic of the region, and man's influence has tended merely to reinforce rather than to introduce this feature. Thus it seems probable that fires have been a factor in supplementing the natural park-like openings. In addition to the burned areas found upon Isle Royale, other limited open areas are due to cultivation and are kept open.

The birds characteristic of the more open situations are the Sharp-tailed Grouse, Song and Chipping Sparrows, Flicker, and the Purple Finch. The Grouse is a Plains form, is near its eastern limit, and is perhaps a late arrival upon the island. The other species are wide ranging in the Canadian coniferous forests but are not of such northern range as the aquatic and shore associations. There is nothing in their range to suggest their arrival earlier than the forest association. Taking all the birds of the openings together, it is not improbable that they arrived at about the same time as those of the forests, but frequented different situations,—the forest kinds occupying the slopes and drier valleys, and the others the openings.

c. The Climax Association or Formation and Habitat.

The climax association should not be considered in such a way as to lead one to think that it is *distinct* from the other associations. It belongs to *all* of them as the end of their series under existing biotic and environmental conditions. Thus the aquatic association, through the bog conifers, is transformed into the Balsam-spruce association; and from the beach through the aspen-birch association again to the balsams and spruces. The climax association is the condition of adjustment toward which all societies move under the present conditions. For this reason the earlier stages, conditions and associations of the climax have been outlined in the preceding discussion.

In the dominant forest the dense shade prevents an extensive

ground cover of herbaceous plants; and although Ground Hemlock is abundant locally, yet in places the forest floor is quite open and free from lower shrub growth. The remarkable preservation of trails or roads through such tracts shows clearly how slowly changes take place. Such a habitat must be relatively equable in its temperature and moisture relations.

Geographically speaking, the primary characteristic of the climax is its *relative stability*, due to a dominance or relative equilibrium produced by the severe environmental and biotic selection and adjustment throughout the process of succession.

At this point attention should be called to the fact that dominance is a resultant of an equilibrium produced by neutralizing or overcoming other forces and influences. We may think of the process of succession as a stream of forces whose development may be compared with the transformation of a drainage line,—such as, for example, that of a rivulet into a creek, and then into a river. The stream and the character of the ground mutually influence each other and the course followed is a resultant of the mutual adjustments. The stream is deflected by one condition and then another, just as succession varies with local conditions; yet the water continues to run down grade and seeks an equilibrium, and similarly, biotic succession continues on its course deflected here and there by local influences, yet forever tending toward a state of biotic equilibrium. The dominance of the climax society or formation, considered as a process rather than a product, has much in it that is analogous to the dominance produced by the process of baseleveling.

The characteristic birds of the climax forest are:—the Chickadee, Golden-crowned Kinglet, Red-breasted Nuthatch, Canada Jay, Downy, Hairy, Arctic Three-toed and Pileated Woodpeckers, and the White-winged Crossbill. Here again the association becomes small in variety of species and comparable with the small society which must have been associated with the complete dominance of the Lake waters. Thus there has been a development of diversity from simplicity, with later a return to simplicity. To these birds of the forest should also be added those species of general distribution, as the Eagle, Swift, Swallows, etc., a class of birds whose predaceous, insect-feeding and wide ranging habits make them particularly difficult to properly associate. A careful study of

this class of birds will be necessary before they can be satisfactorily correlated with their proper avian associations.

But let us not overlook the fact that even this dominance is only *relative*, for since the Ice Age even this *entire formation* has migrated northward, and a true succession has been produced with its attendant changes in the conditions and in the composition of the associations. Just as upon Isle Royale a definite dynamic trend was given to the complete environment by the falling Lake surface, so in the post-Glacial northward migration there was a northward migrating climate. These conditions determined that on the *north side* of this immense succession or migration habitats and associations were developed which are comparable to those attending the downward march of the Isle Royale beach; and even to-day, by passing from Isle Royale to the tree limit with its zone of aspens and birches, one may find representatives of the various kinds of associations which in all probability moved north, just as to-day in passing from the forest to the rocky beach balsams and spruce are encountered before the aspens and birch. If however, this is only another case of convergence and not at bottom the same or a comparable process, we are then certainly far from an understanding of even the general nature of the problem.

3. *Internal Factors.* With the idea of succession, as exemplified by Isle Royale, let us turn to other factors which influence the internal relations of the birds within an association or society, because such relations are also necessary to an intelligent understanding of succession. Some of these general relations have been outlined, but certain others are needed which have been well expressed by Brewster ('06, p. 62-63): "Many if not most birds show a marked preference for breeding in certain regions, throughout which they are more or less evenly and generally distributed, but within which their numbers do not seem to increase beyond fixed maximum limits no matter how carefully the birds may be protected or how successful they may be in rearing their young. . . . I have observed — as, indeed, who has not! — that few birds — excepting those which, like Swallows, Terns, Herons, and Gulls, are accustomed to nest in colonies — tolerate very near neighbors of their own species during the season of reproduction. At its beginning each pair takes possession of a definite tract of wood-

land, orchard, swamp or meadow, which the male is ever on the alert to defend against trespassers of his own kind and sex, although he often seems quite willing to share his domain with birds of other and perhaps closely related species. The extent of the area thus monopolized varies exceedingly with birds of different species. An apple orchard which affords sufficient room for — let us say — two pairs of Yellow Warblers, two pairs of Orioles, three or four pairs of Chippies and four or five pairs of Robins, seldom or never harbors more than a single pair of Kingbirds or Crested Flycatchers As a rule, the species which roam over the most ground in the course of their daily wanderings claim and maintain the broadest preserves, while those of sedentary habits often content themselves with very modest freeholds. Whatever the extent of the domain, the birds who occupy it as a summer home evidently regard it as exclusively their own. The readiness and celerity with which trespassing birds are accustomed to retire when attacked or even merely threatened by the established tenants, has seemed to me to indicate that the claims of temporary ownership are respected by all right-minded birds. . . . In my opinion the desire for exclusive possession so conspicuously shown by the male, and often by him alone, is usually the direct result of *sexual jealousy*. This, as is natural, makes him intolerant, during the breeding season, of the near presence of rival males. If his concern were chiefly in respect to the food supply, it would be equally manifested at every season and towards all birds who subsist on the same food that he and his mate require — which is certainly not the case."

The tendency of pairs and species to *space themselves* and to become *relatively sedentary* is thus a characteristic condition in an association, and is an important element in an understanding of succession because it shows the internal organization and habit with which an invader or pioneer from another association has to contend. As Dixon ('97, p. 91) has pointed out, this spacing tendency is an important factor in the extension of range of species and is intimately related to the location of nesting sites. These facts clearly show that both these internal influences and the environmental ones must be distinguished if we wish to determine the relative influence of each and their bearing on succession. The above quotation from Brewster clearly shows that in general not only a

greater number of birds can live in a given area, but also that they can live closer together, if they vary in kind. Then again, within the association there are marked differences in habitat preference. Thus in the forest there are those birds which nest in the trunks or among the topmost branches of the trees, or even upon the ground; and these are differences largely distinct from the spacing of the pairs of the same species. These influences must be recognized among the dominant influences within the association, and upon which much emphasis must be placed.

4. *Environmental Factors.* Then in addition to these internal factors, there are the dominant physical factors. In the following discussion primary emphasis will be placed upon succession as found in the Northeastern Biotic or Conifer Center, because successions at other centers with different biotic components and other dominant physical conditions must possess a certain amount of individuality, in addition to those features common to succession in general. The dominant biotic tendency or dynamic trend of this center, as a *resultant of all internal and environmental influences*, is for the conifer biotic association to *encroach upon all other societies and habitats and to become the dominant or universally distributed association*. Thus, in general, all habitats produced by local influences tend to become transformed into the dominant biotic association or formation. In general also, small bodies of water are rapidly encroached upon by inwash, vegetation or drainage, and tend to become extinct and forested. All other openings, as the rocky ledges and ridges or burns, are encroached upon as soil accumulates or fires are prevented, and the forest biotic association spreads over the entire area.

From such relations it will be seen that our knowledge of the causes and conditions of succession must largely result from the study of these *local environments or habitats and their biotic succession*, because, where dominance is established the succession is almost completely obliterated. *Each minor habitat and society is to be looked upon as simply a stage, more or less temporary, in the onward wave toward the dominant or climax association*. Thus in the marshes, birch or aspen woods, rock openings and ponds may be "original" conditions which are becoming cumulatively transformed in the direction of the final dominance of the climax biotic type.

The relatively slow rate of change in many environmental processes and the relative stability of the climax biota,¹ is doubtless the basis for the current view that such conditions are relatively constant or fixed; but that change and not constancy is the normal and usual condition in nature is quite evident upon a moment's reflection. Almost every one notices these changes after an absence of a few years from a region. Thus intimacy tends to blind us to changes unless a *habit* of giving attention to them is deliberately cultivated. For this reason some find it almost impossible to recognize environmental changes or to comprehend their significance. It is therefore of practical value to clearly recognize under what conditions changes may be most readily perceived. Therefore the importance of the study of *local influences* is emphasized, and the necessity recognized of distinguishing the dominance of geographic and relatively stable conditions or formations as contrasted with those due to local and often relatively changeable conditions. Then among these changes we must distinguish those which are mere fluctuations and those which are indicative of the true progressive succession. This is mainly accomplished by attention to general relations and the subordination of minor details.

5. *Environmental and Associational Convergence.* At the present imperfect stage of ecological development, comparison must furnish us the most important and general clues to the processes of succession; and undoubtedly this method must long remain as our main guide on account of its comprehensive application and the magnitude of the problem to be solved. It is therefore desirable that the limitations of the method should be clearly borne in mind. It is often assumed that the implied successions of a given place are the same as those which have developed at that place in the evolution of the present climax. But as we positively know that *many different causes are able to produce the same or very similar results*, such conclusions must be received with due caution. That the dominant geographic conditions tend to override local influences seems very fairly established because *diverse local or original conditions are transformed into the climax or dominant type*. This clearly shows that in time diverse local influences have flowed into the general environmental trend or current and have become a part of it.

¹ For the migrations of climax societies, cf. Adams, '05.

There is thus a very strong *convergent* tendency. By convergence is meant the independent production of the same kind of association from diverse starting points or habitats and associations. Quite minor ecological units may show similar but temporary convergent tendencies in their succession. It is therefore not surprising that any marked environmental dominance will tend to produce similar or convergent results, even in local areas. Under such circumstances similar associations or societies may be independently and repeatedly formed by the selecting environmental influences, such as, for example, are found in the numerous small lakes scattered throughout the coniferous forests. This convergent phenomenon is certainly a fertile source of confusion throughout all phases of science. Perhaps the best guide through such a labyrinth will be to clearly bear in mind the relative value of general and local influences, and watch with an "eternal vigilance" for convergent results due to diverse causes. This convergent phenomenon is particularly liable to occur in the case of environments produced by reversible physical conditions. It should further be stated that a study of these problems from a genetic and dynamic point of view will aid in recognizing such results. Under such circumstances attention is primarily directed toward the dominant causes and conditions of change rather than to the stages, products, and results produced by them. Convergence thus viewed is the result of several causes and should be considered a product rather than a process. This same distinction may be made for all societies, associations and formations. *Convergent phenomena are thus particularly liable to confuse wherever products rather than genetic processes receive primary emphasis.*

6. *Succession and Environmental Evolution.* The relation of succession to general biological problems is very intimate. This opens up a very extensive field which is only mentioned to indicate its general relation to succession. The facts of succession and evolution must ever remain far in advance of our knowledge of their causes. If, however, one turns to the standard evolutionary treatises and searches for a discussion of the evolution of the environment, as correlated with animal evolution, only the most general, or the elementary and superficial phases, are as a rule discussed. To be sure, certain papers and treatises take up special phases of

the problem, and the broadest phases are treated by the geologists; but none of them seem adequate as a comprehensive treatment of so important a subject. Succession, broadly and genetically considered (dynamic rather than static), is a phase of environmental evolution.

7. *The Relation of Succession to Organic Evolution.* Mention has been made of the relation of succession to environmental evolution, but its relation to the organic evolution of birds should also be indicated. The mutual relations of organic and environmental evolution have been and will continue to be the battleground of biological thought for an indefinite length of time. Here lies the tension line between the two main schools of biological interpretation.

One school maintains that all *causes* of evolution are *internal*, and that the environment is only a *condition*, not a cause. From this point of view the fundamental causes are internal and therefore environmental conditions can only indirectly influence evolution through the weeding out of those forms not in harmony with the conditions; and hence it has a *selective* rather than an *originative* influence. From this point of view succession and environmental evolution can contribute nothing to the elucidation of the *causes* of organic evolution, though they may to an understanding of the selection produced by the succession of conditions in which organic evolution has taken and is taking place. In harmony with this point of view, succession, broadly treated, should furnish a fundamental method of treatment for the process of selection, and the detailed principles of its working. This would certainly be an important advance because natural selection has frequently been reproached for its indefinite methods and lack of definite treatment. Succession from this point of view is primarily related to the Darwinian factors of evolution. No doubt this is one reason why Darwin himself put such high value upon the study of ecological relations of animals, *i. e.*, their relation to their complete environment, or their struggle for existence.

If, however, all causes are internal and not directly subject to external influences, they must be beyond experimentation to a corresponding degree. Under such conditions evolution becomes a *descriptive* rather than a *causal* science, and all that investigation

can do is to describe the succession of forms produced by these internal causes.

On the other hand the rival school maintains that both internal and external conditions may be real *causes* of organic evolution. This is thought to be brought about by the direct or indirect influence of the environment upon the germ cells, by environmental selection, or even by both combined. From such a point of view the environment may thus be either a *cause* or a *condition* of organic evolution, or both. From such a standpoint the evolution of the environment receives increased importance, as under such conditions organic and environmental evolution are causally related, and thus intimately correlated. Viewed thus, environmental evolution is more than the description of the succession of conditions, but may be explanatory as well.

The particularly significant feature is that environmental evolution and biotic succession are of great value and can contribute either to the causes or conditions, or to both, of evolutionary advancement.

VI. SOME ADVANTAGES OF A KNOWLEDGE OF THE LAWS OF SUCCESSION.

The study of succession implies a detailed knowledge of the field relations of birds, and as this has received so little attention as a subject of special study, it is perhaps worth while to briefly mention some of the practical and scientific advantages which we may reasonably expect will result from the development of this phase of investigation.

The current discussions of environments are generally very fragmentary and chaotic, and the careful study of bird habitats and succession will greatly improve this phase of ecology. Here is a field of study in need of distinct recognition as a subject worthy of detailed investigation, in addition to those lines already current. When once this field is developed, then and only then will it be possible to intelligently discuss the evolution of avian environments and to correlate them with the evolution of birds themselves. It is quite probable that one of the main conditions which prevents a

more rapid advance along evolutionary lines is in a large measure due to the almost utter failure to analyze dynamically environmental complexes. Succession, studied in its broader aspects, should greatly aid in the formulation of the laws governing the "struggle for existence," which is frequently condemned for its indefinite character.

From another point of view there are very important reasons for urging extensive studies of this character at a relatively early date, because the encroachments of civilization, which by the destruction of the forests, the drainage of the land, irrigation, farming and grazing of the grasslands, are rapidly destroying original environmental conditions before they are studied ecologically. Much of Europe has already gone through this stage of demolition, and it is only to new and relatively unmodified countries that we can look for an adequate statement of these problems and their relations in their original and primarily evolutionary and developmental form. It is not improbable that the next generation may wonder why some subjects, the investigation of which might have been delayed, have received detailed attention, while others equally or perhaps even more important have been almost ignored and must forever remain unknown because of this neglect to secure the "vanishing data." (Cf. Haddon, '03.)

Such ecological studies may be expected to have a valuable reflex influence upon the naturalist himself. We may hope that the future revisor of a group of birds will consider a knowledge of the field relations of his specimens as an essential qualification, just as at the present time a large series of specimens is held necessary. Fifty years ago a limited series was considered no disqualification, just as to-day the lack of a knowledge of their ecological relations is not so considered. Perhaps our ideas of relative values must change. In this connection a statement from Tristram ('94, p. 472) is to the point:—"The closet systematist is very apt to overlook or take no count of habits, voice, modification and other features of life which have an important bearing on the modification of species. To take one instance, the short-toed lark (*Calandrella brachydactyla*) is spread over the countries bordering on the Mediterranean; but along with it, in Andalusia alone is found another species, *Cal. bactida*, of a rather darker color, and with the second-

aries generally somewhat shorter. Without further knowledge than that obtained from a comparison of skins, it might be put down as an accidental variety. But the field naturalist soon recognizes it as a most distinct species. It has a different voice, a differently shaped nest; and, while the common species breeds in the plains, this one always resorts to the hills. The Spanish shepherds on the spot recognize their distinctness, and have a name for each species."

Many examples of similar character might be cited to show the scientific value of a knowledge of the environmental relations of birds, and a moment's reflection will show that the problem of succession is only a small part of the general problem of environmental relations of plants and animals. Attention has already been directed to the relation which this general subject bears to evolutionary problems.

It is not at all unlikely that succession is very closely related to some of the causes of bird migration, and that with advance in this subject much light would be thrown upon migration. Migration is doubtless another illustration of convergent phenomena. In all probability, migration has originated not only independently in very diverse kinds of birds, but perhaps repeatedly, from different causes, even in the same group. The causes of migration must be numerous, varying with different ecological groups, which appear to be the true natural units for study and comparison. Thus the comparative study of migrations of different kinds of associations, as formations and societies, should lead not only to a better understanding of the various associations, but should also contribute to the general subject of migration which seems to have shown a tendency toward stability in the current methods of study. It scarcely seems probable that with the diverse formations inhabited by birds, and with their ecological diversities there should be only a few causes of the phenomena.

To keep pace with successions animals must either adjust themselves, change their habitat, or migrate. From such relations it is evident that various supposed environmental responses must be *tested primarily within the association and environment to which the animal normally belongs*. To this class belongs protective coloration and allied phenomena. To be of fundamental value, the

influence must have some permanence and this may be sought in the *dynamic* trend and dominant influences of different associations. It is difficult to conceive of other more reliable methods of approach to such problems.

In addition to the scientific value of this line of investigation, there are important economic applications of the laws of avian environment. This is particularly true of forestry and agriculture. The forestry problem is continually becoming more important, but the relation of bird life to forests and forest succession has received little attention. As agents for scattering seeds of trees and shrubs, birds are very important. Here is where the interests of the avian ecologist and forest ecologist overlap. The student of bird life will wish to know how a region is to be reforested, and what succession of bird life will attend the succession of the forest as reforestation progresses. On the other hand, the forester will wish to know how birds will aid or retard him in the process of reforestation. Then, in guarding or protecting the forest, what help can be secured from birds with regard to insect pests? These are only samples to show that here is a field which, as time advances, will become of more and more importance, and that these problems will eventually call for specially trained men to handle them.

In connection with forestry and agriculture we have quite exceptional conditions for extended experimental studies in bird succession as related to forest succession, crop rotation, etc. The relation of birds to agriculture appeals to a much larger number of people than does their relation to forestry. There are several reasons for this; first, because more persons are interested in farm and horticultural crops than in forests; and second, because birds are soon attracted in such large numbers by the food supply of grains and fruits which these crops so greatly increase, that the extensive destruction by birds readily attracts attention. And while we hear much of the great reduction of certain species of birds in parts of the country, it is not at all improbable that with the destruction of the forests (which were dense and dominant and tended to *limit* the abundance of many species frequenting the open), and the increase of food in cultivated fields, there has been an increase in the total number of birds, even in spite of the great numbers killed by man.

But to the phase of succession with which we are primarily

concerned, almost no attention has been given, in spite of its fundamental relation to crop rotation and the corresponding avian succession attending this. Indeed there seems to be a very decided need of a thorough investigation and discussion of the general principles underlying all these economic problems, that they may be brought into harmony with the advances made in some other phases of ecology.

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THE BIRD COLONIES OF THE OLYMPIADES.

BY WILLIAM LEON DAWSON.

THE recent creation by executive order of three reserves among the islands which lie off the west coast of Washington has served to call attention for the first time, in an ornithological way at least, to this hitherto little-known coast. The reasons for previous neglect are not far to seek. No really safe harbors offer, for even the smallest craft, between the mouth of Gray's Harbor, Lat. 46° 56' N., and the Straits of Juan de Fuca, Lat. 48° 24' N. The prevailing winds are westerly, and the aspect of the coast so menacing, as viewed from the seaward side, that mariners have always given it a wide berth, save when seized by some hapless mischance of reckoning or tackle.

No commercial exploitation of the tributary country has been attempted, beyond the preëmpting of timber lands some twenty years ago, and the occupation by hardy settlers of a few small prairies and rich alluvial bottoms. Only recently a spur of the Northern Pacific Railway has been built from Hoquiam, on Gray's Harbor, to Moclips, on the coast; and this latter point marks nearly the northern extension of a splendid sea-beach, hard as macadam, which stretches south, practically to the Columbia River. To the north of Moclips the beginning of the rough way is marked by Point Grenville, and the ocean drive becomes a tradition.

The ruggedness of the succeeding stretch is occasioned apparently by a great fault, or crack in the earth's crust, running roughly north and south. The sea-floor has been dropped to westward leaving the exposed edges of the strata on shore to the mercy of the waves. In some places the tough strata, chiefly sandstone and conglomerates, presumably Miocene, were bent sharply before breaking; so that now, in the form of detached islets and promontories, they stand on edge, balancing in the most precarious and fantastic forms. One such rock, off Toleak Point, rises to a height of one hundred feet, with a thickness of only twenty at the tide line,—so thin, indeed, that the sea has worn a keyhole near the bottom and the air another near the top. Moreover, the shore-line is complicated by transverse folds of rocks, the precursors of the Olympic Mountains to the eastward; and these are usually marked offshore by a chain of islets in descending series, the outermost member of the series being the most denuded, and the innermost being mere detached fragments of the mainland with forest crowns intact. It is thus that the more than one hundred and thirty islets which rise above the spray-line, are grouped into nine principal systems, roughly corresponding to the chief promontories.

The coast-line of this hundred mile stretch is further interrupted by several rivers, none of them long streams, but each of considerable volume because of the extraordinary rainfall which characterizes this section. The precipitation at La Push was 155 inches for the year 1905, and 100 inches for the last five months of 1906. It goes without saying that "saturated" plumages may be found here in their perfection. There is a corresponding density of vegetation, especially along the crest of the sea-wall, where the jungle of salal and dwarf salmon-berry is nourished by ten months of rain and mist and two of fog, and where the rough trail which is resorted to at high tide resembles a tunnel rather than a footpath. A luxuriant growth of evergreen timber, chiefly tideland spruce and giant cedar, covers the entire western slope of the Olympic peninsula; but along the immediate shore-line it often presents a stunted appearance, due either to salty spray or wind, or both. Those islands which are totally devoid of trees may, nevertheless, be crowned with an almost impenetrable growth of mingled salal

and salmon-berry; or, failing that, may support a heavy crop of saw-grass centrally, and wire-grass upon the slopes.

Because of their proximity, considered as a whole, to the Olympic Mountains, and because they are in a sense a by-product of the same orogenetic movement, I have proposed for these western islands the name Olympiades (pronounced Olympiah'-deez). The name will be all the more convenient now that they are arbitrarily divided into three administrative groups, the Copalis Rock Reservation, the Quillayute Needles Reservation, and the Flattery Rocks Reservation.

In July, 1905, the writer, accompanied by wife and child, effected a reconnaissance of these islands, using for the purpose the staunch cedar canoe of the Northwest, manned by two Indian boatmen. We launched at Point Grenville on July 7 and arrived at Neah Bay on the 25th of that month. As the trip was purely ornithological, practically all the rocks, save Copalis at one extreme and Tatoosh at the other, were inspected, and landings were made upon twelve of them which bore the largest bird colonies. In each case the attempt was made to estimate the bird population as well as to ascertain the horizon of species. The results obtained were supplemented by an expedition in June, 1907, in which I had the pleasure of being accompanied by Professor Lynds Jones. On this latter occasion, starting from Neah Bay, we went as far south as Destruction Island, using as before the Indian canoe, and returned over the same course, June 4 to 24.

Among the sea-birds we found the breeding population of the Olympiades to comprise the following species:

- Tufted Puffin (*Lunda cirrhata*).
- Rhinoceros Auklet (*Cerorhinca monocerata*).
- Cassin Auklet (*Ptychoramphus aleuticus*).
- Pigeon Guillemot (*Cephus columba*).
- California Murre (*Uria troile californica*).
- Glaucous-winged Gull (*Larus glaucescens*).
- Western Gull (*Larus occidentalis*).
- Kaeding Petrel (*Oceanodroma kaedingi*).
- White-crested Cormorant (*Phalacrocorax dilophus cinctatus*).
- Brandt Cormorant (*Phalacrocorax penicillatus*).
- Baird Cormorant (*Phalacrocorax pelagicus resplendens*).
- Black Oystercatcher (*Hæmatopus bachmani*).

Of these twelve three, viz., *Cerorhinca monocerata*, *Ptychoramphus aleuticus*, and *Oceanodroma kaedingi*, were never seen by daylight save as unearthed from their nesting-burrows.

Baird Cormorants, the Gulls, and the Oystercatchers are by no means confined to the islands enumerated below, but are found upon all the lesser rocks as well as upon the more rugged parts of the mainland shore,—in short, wherever conditions are suitable. The Oystercatchers do not colonize in the strict sense, and are usually distributed at the rate of a pair to a rock, but the largest islands may boast from three to a dozen pairs of them. The Baird Cormorants have a single eye to the availability of a nesting spot, stipulating only that it shall be upon the side of a wall, and as nearly inaccessible as possible; but whether affording shelter for one pair or a hundred matters nothing.

The Western Gulls occupy exclusively the southern members of the Olympiades, and give way before Glaucous-wings from Destruction Island northward. A slender strain of the darker bird, however, reappears in the larger northern colonies of nesting *glaucescens*, and their apparent interbreeding with the latter is worthy of careful investigation. The Gulls, while preferably nesting in colonies, nevertheless overflow by pairs and dozens upon the smaller pinnacles, so that no exact account of their nesting places is possible.

The following species of non-breeding sea-birds appear to occur regularly along this coast in summer, and are listed in the order of their abundance, beginning with the most numerous:

Marbled Murrelet (*Brachyramphus marmoratus*).

Dark-bodied Shearwater (*Puffinus griseus*).

White-winged Scoter (*Oidemia deglandi*).

Surf Scoter (*Oidemia perspicillata*).

Harlequin Duck (*Histrionicus histrionicus*).

American Scoter (*Oidemia americana*).

Holbøll Grebe (*Colymbus holbøllii*).

Western Grebe (*Aechmophorus occidentalis*).

Loon (*Gavia imber*).

So late as the 5th of June Pacific Divers (*Gavia pacifica*) were found migrating northward in considerable numbers; as were also Northern Phalaropes (*Phalaropus lobatus*). A flock of Heermann

Gulls, sighted on Split Rock July 12, 1906, are believed to have been migrants *en route* to Puget Sound (more strictly Washington Sound, as the lower portion is called) via the Straits of Juan de Fuca.

As early as the 7th of July shore birds were returning, and we noted the following species in that month:

- Pectoral Sandpiper (*Actodromas maculata*), July 7.
- Western Sandpiper (*Ereunetes occidentalis*), July 7 ff.
- Knot (*Tringa canutus*), July 7.
- Black Turnstone (*Arenaria melanocephala*), July 12 ff.
- Wandering Tattler (*Heteractitis incanous*), July 13 and 16.
- Semipalmated Plover (*Ægialitis semipalmata*), July 16 and 17.
- Yellowlegs (*Totanus flavipes*), July 16.
- Hudsonian Curlew (*Numenius hudsonicus*), July 16 and 25.
- Ruddy Turnstone (*Arenaria morinella*), July 17.
- Northern Phalarope (?) (*Phalaropus lobatus*), July 25.

It is not expected that the Censuses following will prove anything less than tedious to the casual reader; but it is believed that a concise record of the present bird population of the Olympiades will prove of value in the future in attempting to measure the effect of changed conditions. Inasmuch as some of the islands are here named for the first time, it has seemed wise to add a brief physical description of each, as well as to give its approximate location as determined by measurement of Coast and Geodetic Survey Chart No. 6400. Heights of islands are oftener guessed than otherwise, inasmuch as the Coast and Geodetic Survey chart figures are sometimes grossly inaccurate; *e. g.*, "Perkins Reef (110)" — it is not really more than 25 feet above tide; "Carroll Islet (126)" where (226) is evidently intended, etc.

"R" signifies breeding resident; and "V" visitor, whether migrant or from the mainland. Only adult birds are counted.

ERIN.

Loc.—Lat. 47° 18' N.; Long. 124° 16'; S. E. from Point Grenville; offshore 200 yds.

Area.—About 1½ acres.

Desc.—A rock, 125 feet high. Perpendicular half-walls except on north side, where climbable. Shaped like a curb roof on top, sloping W., N., and E. Earth-capped, with dense wire-grass.

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|---------------------------------|---------------------------|
| R. Tufted Puffin, 2000. | R. Baird Cormorant, 50. |
| R. California Murre, 20. | V. Pectoral Sandpiper, 6. |
| R. Kaeding Petrel, 10000-25000. | |

ERIN'S BRIDE.

Loc.— As last; offshore 275 yards.

Area.— About half-acre.

Desc.— Narrow rock 125 feet high with nearly perpendicular sides and unclimbable. Covered with fresh Cormorant guano.

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| R. Western Gull, 50. | R. Baird Cormorant, 100. |
| R. White-crested Cormorant, 100. | |

THE GRENVILLE ARCH.

Loc.— Lat. 47° 18' 20" N.; Long. 124° 17' W.; S. W. from Point Grenville; offshore half mile.

Area.— About 1 acre.

Desc.— Conical rough rock 100 feet high, sloping on S. and W., perpendicular on N. and E.; tunnelled through middle by large arch about 40 feet high.

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| R. Pigeon Guillemot, 10. | R. Brandt Cormorant, 100. |
| R. California Murre, 10. | R. Baird Cormorant, 100. |
| R. Western Gull, 50. | R. Black Oystercatcher, 1 pair. |
| R. White-crested Cormorant, 100. | |

THE GRENVILLE PILLAR.

Loc.— Just off Grenville Point.

Area.— About quarter acre.

Desc.— Perpendicular, undercut on N., unscalable. Earth-topped, with grass.

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| R. Tufted Puffin, ? | R. White-crested Cormorant, 100. |
| R. California Murre, 500. | R. Brandt Cormorant, 100. |
| R. Western Gull, 40. | R. Black Oystercatcher, 1 pair. |

SPLIT ROCK.

Loc.— Lat. 47° 24' 20" N.; Long. 124° 21' 45"; offshore about one mile.

Area.— About 1 acre.

Desc.— Barren double rock of metamorphic breccia, 85 feet high, very rough as to surface; north slope covered with small water-holes.

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| R. Pigeon Guillemot, 10. | R. Black Oystercatcher, 1 pair. |
| R. Western Gull, 200. | V. Heermann Gull, 10. |
| R. White-crested Cormorant, 2 pairs. | V. Western Sandpiper, 6. |

WILLOUGHBY ROCK.

Loc.—Lat. 47° 24' 40" N.; Long. 124° 21' 22" W.; offshore $\frac{3}{4}$ mile.

Area.—About 3 acres.

Desc.—125 feet high, rounded, earth-capped over worn metamorphic conglomerate; vertical on W., very steep S., N. and E., but climbable on south. Heavily grassed on top, guano-covered on sides,—a varied and populous rookery.

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| R. Tufted Puffin, 500. | R. Baird Cormorant, 500. |
| R. Pigeon Guillemot, 10. | R. Black Oystercatcher, 1 pair. |
| R. California Murre, 300. | V. Black Turnstone, 1. |
| R. Western Gull, 100. | V. Western Sandpiper, 10. |
| R. White-crested Cormorant, 50. | |

DESTRUCTION ISLAND.

Loc.—Lat. 47° 40' 20" N.; Long. 124° 30' W.; offshore $3\frac{1}{2}$ miles.

Area.—Top 60 acres — with surrounding reefs; about $\frac{1}{2}$ square mile.

Desc.—A flat-topped island with sharply sloping or nearly perpendicular sides, rising 60 feet above tide. Covered by dense growth of vegetation, chiefly salmon-berry and salal thickets growing to height of a man's head, or higher on top; same with grass and bushes of other sorts on sides. Composed of deep loam (guano?), clay, gravel (incipient conglomerate of Pleistocene age) in descending series, resting unconformably upon the upturned edges of Miocene sandstone. Extensive area of sandstone reefs exposed on all sides of island at low tide, including ribs and ridges of sculptured rock unreached by water save in time of storm.

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| R. Rhinoceros Auklet, 10,000. |
| R. Pigeon Guillemot, 30. |
| R. Glaucous-winged Gull, 2 pairs. |
| R. Black Oystercatcher, 12 pairs. |
| R. Rufous Hummer (<i>Selasphorus rufus</i>), 20. |
| R. Rusty Song Sparrow (<i>Melospiza cinerea morphna</i>), 100. |
| R. Sooty Fox Sparrow (<i>Passerella iliaca fuliginosa</i>), 100. |
| R. Barn Swallow (<i>Hirundo erythrogaster</i>), 20. |
| R. Lutescent Warbler (<i>Helminthophila celata lutescens</i>), 100. |
| R. Yellow Warbler (<i>Dendroica aestiva</i>), 4. |
| R. Western Winter Wren (<i>Olbiorchilus hiemalis pacificus</i>), 10. |
| R. Russet-backed Thrush (<i>Hylocichla ustulata</i>), 100. |
| R. Western Robin (<i>Merula migratoria propinqua</i>), 2. |

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| V. Glaucous-winged Gull, 300. | V. Yellowlegs, 1. |
| V. Western Gull, 20. | V. Wandering Tattler, 1. |
| V. Heermann Gull, 10. | V. Hudsonian Curlew, 2. |
| V. White-crested Cormorant, 40. | V. Semipalmated Plover, 6. |
| V. Baird Cormorant, 200. | V. Ruddy Turnstone, 3. |
| V. Fannin Heron, 2. | V. Black Turnstone, 25. |
| V. Western Sandpiper, 400. | |
| V. Bald Eagle (<i>Haliaeetus leucocephalus</i>), 1. | |
| V. Peale Falcon (<i>Falco peregrinus pealei</i>), 1. | |
| V. Black Merlin (<i>Falco columbarius suckleyi</i>), 1. | |
| V. Desert Sparrow Hawk (<i>Falco sparverius phalena</i>), 1. | |
| V. Northern Raven (<i>Corvus corax principalis</i>), 2. | |
| V. Northwest Crow (<i>Corvus caurinus</i>), 2. | |

NORTH ROCK.

Loc. — Lat. 47° 44' 45" N.; Long. 124° 29' 50" W.; offshore 1½ miles.

Desc. — An inaccessible pillar of barren rock 100 feet or so in breadth, 40 in thickness, and 100 in height; whitened by long use as cormorant rookery, and very picturesque.

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| R. Glaucous-winged Gull, 10. | R. Baird Cormorant, 200. |
| R. White-crested Cormorant, 100-300. | R. Black Oystercatcher, 1 pair. |

ALEXANDER ISLAND.

Loc. — Lat. 47° 47' 40" N.; Long. 124° 30' 30" W.; offshore 1¼ miles.

Area. — About 10 acres.

Desc. — A large green-topped, curb-roofed mass of fine conglomerate, about 100 feet high, perpendicular on N., sloping approach on S. Deep embayment on south side of island, with steep sides. Crown with heavy turf, stunted brush, and several dwarfed spruce trees.

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| R. Tufted Puffin, 5000. | R. Baird Cormorant, 300. |
| R. Cassin Auklet, 1000. | R. Black Oystercatcher, 12 |
| R. Glaucous-winged Gull, 50. | R. Rusty Song Sparrow, 6. |
| R. Western Gull, 2. | V. Northern Raven, 2. |
| R. Kaeding Petrel, 1000-10000. | V. Northwest Crow, 2. |

ROUNDED ISLET.

Loc. — Lat. 47° 49' 40" N.; Long. 124° 34' W.; offshore half mile; off Toleak Point SW.

Area. — About 1 acre.

Desc. — A rounded rock mass about 100 feet in height, with dome-shaped green top, dense with vegetation, coarse grass, and dwarf bushes.

Not explored, but known to harbor:

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| R. Tufted Puffin, 500. | R. Baird Cormorant, 200. |
| R. Glaucous-winged Gull, 100. | R. Black Oystercatcher, 1 pair. |

THE GIANTS' GRAVEYARD.

Loc.—Lat. 47° 50' 30" N.; Long. 124° 34'; offshore 100 yards to $\frac{3}{4}$ mile.

Desc.—A group of jagged rocks and pinnacles, some nineteen in number, rising from 40 to 150 feet above tide, and representing the last stages of erosion of a Miocene sandstone set on edge. It is impossible to exaggerate the sharpness or sheerness of some of these headstones but even the wildest, if high enough, affords lodgment for the Gulls and the Baird Cormorants; while the bases of the largest all boast their pair of Black Oystercatchers. Only one rock deserves particular mention:

Ghost Rock.—The northernmost of the group, very bold in outline, higher than wide and narrowing at base. This rock is everywhere white with excrement and is entirely given over to the nesting of cormorants.

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| R. White-crested Cormorant, 50. | R. Baird Cormorant, 100. |
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THE QUILLAYUTE NEEDLES.

Loc.—Lat. 47° 33' 4" N.; Long. 124° 39' W.; offshore 100 yards to 1 mile.

Combined *areas*, 4 or 5 acres.

Desc.—An exceedingly picturesque group of rocks off Tealwhit Head, each possessed of strong individuality, whether pinnacle, oval, sugar-loaf, or flat-top, and each distinguished by appropriate Indian (Quillayute) names, which ought as far as possible to be retained.

Dhuoyuatzachtahl (Place-where-we-catch-Petrels) or *Dhuoyuatz* (Petrel) for short.—The western of two distinct islets, lumped on the chart (Coast and Geodetic Survey, No. 6400) as "Huntington Rock," has a height of over 100 feet and an area of above an acre; is perpendicular on W., N. and E., sloping and climbable on S. E. Crest covered with dense coarse "saw-grass" with surrounding border of turf.

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| R. Tufted Puffin, 300. | R. Western Gull, 10. |
| R. Cassin Auklet, 500. | R. Kaeding Petrel, 40,000. |
| R. Glaucous-winged Gull, 10. | R. Baird Cormorant, 20. |

Keeksōōstahl ("Landing-place," no longer appropriate).—Companion to last on the east; of practically equal area; nearly inaccessible.

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| R. Tufted Puffin, 500. | R. Baird Cormorant, 100. |
| R. Glaucous-winged Gull, 200. | Kaeding Petrel, ? |
| R. Western Gull, 6. | |

An inaccessible colony of Glaucous-winged Gulls also appears upon Table Rock, 75 yards or so due south of Keeksōōstahl.

THE JAMES ISLAND GROUP.

Loc.— Opposite La Push, connected with shore at low tide.

James Island is the ancestral fortress of the Quillayute Indians now resident at La Push. It is heavily timbered except on the eastern end, which is given over to gardening; but its abrupt sides support several small colonies of Baird Cormorants. Of the associated rock masses recently disrupted from James only one, *Kohchāā(uh)*, carries an extensive colony of Baird Cormorants, say 200, with associated Glaucous-winged Gulls. A pair of Peale Falcons tyrannize over this group, and rears its young midway of one of the steepest walls.

CAKE ROCK.

Quillayute name, Chah-chah-lakh-hoos-set.

Loc.— Lat. 47° 55' 50" N.; Long. 124° 41' 30" W.; offshore 2 miles.

Area.— About 10 acres.

Desc.— Elliptical rock mass 115 feet high, with sides nearly perpendicular all around. Flat top with rounded elevation in center, all densely covered with brush and turf. Has been climbed by Quillayutes of passing generation, but now practically unscalable.

R. Tufted Puffin, 500.

R. Baird Cormorant, 100.

R. Glaucous-winged Gull, 1000.

R. Black Oystercatcher, 1 pair.

DÖH'ÖDÄĀLUH.

Loc.— Lat. 47° 57' N.; Long. 124° 41'; offshore half mile.

Area.— About 1 acre.

Desc.— Very diversified rock; a sharp ridge of metamorphic sandstone running to a high point and reappearing in outlier spurs or columns; a little wire-grass on upper levels and slopes.

R. Tufted Puffin, 40.

R. Baird Cormorant, 100.

R. Glaucous-winged Gull, 50.

R. Black Oystercatcher, 12.

R. White-crested Cormorant, 20.

V. Black Turnstone, 1.

CAPE JOHNSON GROUP.

Loc.— Centering Lat. 47° 58' N.; Long. 124° 42' W.; offshore 100 yards to $\frac{1}{2}$ mile.

Desc.— Group of some dozen rocky islets, mostly sharp peaks, of which about half carry small colonies of Gulls and Baird Cormorants, with the omnipresent Oystercatchers at base.

JAGGED ISLET.

Loc.—Lat. 47° 59' 25" N.; Long. 124° 44' W.; offshore about 2½ miles.

Area.—Two or three acres.

Desc.—A long ridge of fantastically eroded sandstone, running substantially parallel to shore line, 200 yards long, about 50 yards wide, 68 feet high. Swept by severe storms and entirely destitute of vegetation. Only central and highest portion of island used by sea-birds,—end frequented by sea-lions.

R. California Murres, 6.

R. Black Oystercatcher, 6.

R. Glaucous-winged Gull, 200.

V. Baird Cormorant, 100.

R. Brandt Cormorants, 50.

WISHALÖÖLTH.

Loc.—Lat. 47° 59' 48" N.; Long. 124° 42' W.; offshore about ¾ mile.

Area.—About 20 acres.

Desc.—A lofty, jagged ridge of metamorphic conglomerate with sharply sloping sides covered with guano ledges and resulting areas of shallow earth, which are clothed with grass and other vegetation — yarrow, painted-cup, and the like; 175 feet high; 200 yards long along crest. One principal outlier and several minor ones on E. of same character.

R. Tufted Puffin, 1000.

R. Baird Cormorant, 100.

R. Glaucous-winged Gull, 2000–3000.

R. Black Oystercatcher, 6.

R. Rusty Song Sparrow, 12.

R. Western Gull, 100–500.

V (?) Rufous Hummer, 1.

R. Kaeding Petrel, 5000–15000.

CARROLL ISLET.

Indian name, Habaht-ayleh.

Loc.—Lat. 48° 10' N.; Long. 124° 43' 30"; offshore about 2 miles.

Area.—Ten to fifteen acres.

Desc.—The gem of the Olympiades! A high, rounded mass of sandstone, tree-crowned (20–30 spruces), and with sides chiefly precipitous. The crest is covered also with a dense growth of elder-berry, salmon-berry, and salal brush, while the upper slopes N. and E. are covered with luxuriant grasses. The elevation is nearly 250 feet, and the extraordinary variety of cover attracts every bird known to breed along this coast, save the Rhinoceros Auklet and the Brandt Cormorant, and the latter may be seen from the western crest of Carroll, as it nests on the outlying pinnacle, Paahwoke'-it.

R. Tufted Puffin, 5000.	R. Rufous Hummer, 8.
R. Cassin Auklet, 1000.	R. Rusty Song Sparrow, 12.
R. Pigeon Guillemot, 20.	R. Sooty Fox Sparrow c. 12.
R. California Murre, 700.	R. Western Winter Wren, 8.
R. Glaucous-winged Gull, 1000.	R. Russet-backed Thrush, 4.
R. Western Gull, 50.	V. American Crossbill (<i>Loxia curvirostra minor</i>), 5.
R. Kaeding Petrel, 500.	V. Barn Swallow, 6.
R. White-crested Cormorant, 100.	V. Audubon Warbler (<i>Dendroica auduboni</i>), 1.
R. Baird Cormorant, 500.	
R. Black Oystercatcher, 6.	
R. Peale Falcon, 2.	

PAAHWOKE-IT.

Pinnacle of bare rock, about 75 yards west of Carroll; 125 feet high; inaccessible.

R. California Murre, 200.	R. Brandt Cormorant, 60.
R. Glaucous-winged Gull, 10.	R. Baird Cormorant, 150.

WHITE ROCK.

Indian name, Peechwah'.

Loc.—Lat. 48° 8' 10" N.; Long. 124° 43' 20"; offshore $\frac{3}{4}$ mile.

Area.—About 1 acre.

Desc.—Rock mass about 150 feet high, with abrupt walls and narrow proportions, but with sloping top well grassed. Said to have been scaled by Ozette Indians, but must be very difficult.

R. Tufted Puffin, 200-500.	R. Baird Cormorant, 100.
R. Glaucous-winged Gull, 300-500.	

THE FLATTERY ROCKS.

Loc.—Lat. 48° 10' 45" N.; Long. 124° 45-6' W.; off Cape Alava from $\frac{1}{2}$ to 1 mile.

Area.—Ten to forty acres.

Desc.—Four high islands (about 200 feet elevation), straight in line running W. N. W. from Ozette. Two innermost are wooded and sloping, save that second is precipitous on west end. The two outer are barren rocks with steep sides. Outermost, upon which birds chiefly colonize, may be called *Old Rock*.

R. Tufted Puffin, 500-1000.	R. Black Oystercatcher, 6.
R. Glaucous-winged Gull, 500.	V. Black Turnstone, 1.
R. Baird Cormorant, 500.	

FATHER AND SON.

Loc.—Lat. $48^{\circ} 13' 50''$ N.; Long. $125^{\circ} 43' W.$; offshore $\frac{1}{2}$ mile.

Area.— $\frac{1}{4}$ acre.

Desc.—A guano-covered shaft 150 feet high, nearly destitute of vegetation; unscalable. Outlier (the "Son"), 30 feet high, rising from same base at distance of 100 feet N. E.

R. Glaucous-winged Gull, 100. R. Baird Cormorant, 200.

R. White-crested Cormorant, 20. R. Black Oystercatcher, 1 pair.

POINT-OF-THE-ARCHES GROUP.

Loc.—Lat. $48^{\circ} 15' N.$; Long. $124^{\circ} 43' W.$; offshore $0-\frac{1}{2}$ mile.

Desc.—A series of some thirty conglomerate blocks and shafts, variously undercut and arched, all very bold in outline and arranged chiefly in two parallel groups running west in extension of two prominent headlands. Outermost members of group bear scattered colonies of gulls and cormorants, but only northwesternmost, *Silversides*, heavily populated.

R. Tufted Puffin, 1000.

R. Baird Cormorant, 200.

R. Glaucous-winged Gull, 500. R. Black Oystercatcher, 10.

FUCA'S PILLAR GROUP.

Loc.—Lat. $48^{\circ} 22' 30'' N.$; Long. $124^{\circ} 43' 30'' W.$

Desc.—A series of precipitous outliers of Cape Flattery, typified by Fuca's Pillar, which stands out as sharp-cut and awful as the leaning tower of Pisa. The rocks lying further out are for the most part worn down below the point of safe nesting; but the Pillar proper and its immediate neighbors, together with the adjacent cliffs of the mainland, present unexampled facilities for nesting, being hollowed out by wind action into a perfect honeycomb of recesses and countersunk ledges.

R. Glaucous-winged Gull, 200-500. R. Black Oystercatcher, 12.

R. Baird Cormorant, 1000.

TATOOSH ISLAND.

Loc.—Mouth of Straits of Juan de Fuca.

Desc.—Low-lying, grass-covered, flat-topped, conglomerate rock, with maze of similar outliers. Occupied by Lighthouse and Gov't Wireless Station and imperfectly explored. Would repay closer study.

R. Tufted Puffin.

R. Sooty Fox Sparrow.

R. Cassin's Auklet (?).

R. Barn Swallow.

R. Pigeon Guillemot.

R. Rough-winged Swallow (*Stelgidopteryx serripennis*).

R. Glaucous-winged Gull.

R. Western Gull.	V. Harlequin Duck (<i>Histrionicus</i>
R. Kaeding (?) Petrel.	<i>histrionicus</i>).
R. Baird Cormorant.	V. Northwest Crow.
R. Black Oystercatcher.	V. Black Cloud Swift (<i>Cypseloides</i>
R. Rusty Song Sparrow.	<i>niger borealis</i>).

Adding the maxima of estimates for the separate islands and groups above enumerated (and this is manifestly fair, in view of all the lesser breeding places disregarded throughout the region), and taking out for the nonce Kaeding Petrel, we have a total of some 46,000 for the adult summer population of the eleven species of sea-birds nesting in the Olympiades. Of the Petrels alone it is safe to say that there are from 55,000 to 100,000 more, making a grand total of upwards of 100,000 sea-birds now harboring in the three refuges recently appointed by President Roosevelt.

AN UNPUBLISHED LETTER OF JOHN JAMES AUDUBON TO HIS FAMILY.

BY RUTHVEN DEANE.

THE following letter is one of unusual interest, as it shows the great author in the height of his vigor and enthusiasm, toiling day and night in the city of Baltimore, Md., soliciting subscriptions for the octavo edition, 1840, of his 'Birds of America.' In this city, as well as in all others where he visited, he not only in a short time made many friends, but the most influential citizens rendered him great service in furthering his object.

At the date this letter was written, about 500 copies of Parts 1 to 5 had been published. The work was principally done in Philadelphia. J. and J. B. Burke, 523 No. Front St., furnished the paper, Edward G. Dorsey, 12 Library St., was retained as the printer for the text, while Edward H. Rau, 85 Dock St., did the binding of the Parts as issued. J. T. Bowen, 12 So. Broad St., furnished the paper for the plates and executed the coloring and printing thereof, his charge being \$34 per hundred. Bowen furnished all the lithographs with the exception of the fifteen plates

accompanying numbers 28, 29 and 30. For some reason these were executed by George Endicott, lithographer, 152 Fulton St., New York. Boston furnished 201 subscribers, Baltimore 168, New York City 132, while New Bedford, Philadelphia, Richmond, Washington, Charleston and New Orleans averaged 51 each.

I am under obligations to Mr. John E. Thayer, Lancaster, Mass., for the privilege of examining a set of seven old account books which were kept by Audubon and his sons during the publication of this work, and also for permission to publish this letter, which was pasted in one of the books containing miscellaneous records, lists of subscribers, etc. Mr. Thayer came into possession of these relics in November, 1906. The total number of subscribers to the octavo edition, 1840, of the *Birds*, as recorded in these account books, is 1090, and for the royal octavo edition, 1852-'54, of the *Quadrupeds*, by Audubon and Bachman, 2004.

Baltimore, Feb. 21st. 1840.

11 o'clock at night.

My dear friends

So far so good, but alas! I am now out of numbers to deliver to my subscribers here. Here! where I expected to procure a good number more. This list is composed of excellent men and all good pay. I have in my pocket upwards of one hundred names,¹ whom I am assured are likely to subscribe. Therefor I will not leave Baltimore for some days to come at least. I forward a copy of this list to Chevalier² by the same mail and yet you may as well inquire if he has received it. More numbers I must have as soon as possible as all my subscribers here are anxious about receiving their copies, unfortunately I had only 90 No. 2. I look upon this list as a capital list. I have sent Mr. Ridgley³ of Annapolis a No. 1 and a prospectus, and expect some names tomorrow evening from that quarter.

¹ On the back of this letter is written the names of one hundred and one subscribers; six of these names were crossed off.

² J. B. Chevalier, lithographer, 70 Dock St., Philadelphia, Pa., in 1839-41. While his name appears on the title page of the first five volumes of the octavo edition, 1840, of the *Birds of America*, he was not a co-publisher with Audubon, but was employed by him as an agent and promoter of the work, not only receiving a commission on sales made by him, but up to a certain time shared in the estimated profits.

³ Probably David Ridgley, Librarian of the Maryland State Library in 1840. Author, *Annals of Annapolis*, 1841.

I will remit money to Phila. and will let you know how much as soon as I can. The box has arrived here safely and tomorrow or Monday I will deliver Biographies¹ &c. Dr. Potter² is very ill and poor and yet I hope to get his note before I leave here.

I received a note from dear Johnny³ dated at Norfolk, all well and going on. I expect they are at this moment at John Bachman's. I am fatigued beyond description and had the misfortune last evening of skinning my shin bones, they bled profusely however, and I hope will soon get well, though feel rather sore at this very moment, but I will take care of them.

The amount of attention which I have received here is quite bewildering, the very streets resound with my name, and I feel quite alarmed and queer as I trudge along. Mess. Meckle,⁴ Oldfield⁵ and the Brune⁶ family have all assisted me in the most kind and brotherly manner, indeed I may say that my success is mostly derived from these excellent persons.

I have written to Mr. Mifflins. I feel that Theodore Anderson⁷ will not live long. Mr. Morris⁸ has not yet returned from Annapolis. See that the *notice* in the Baltimore Patriot⁹ which I sent you yesterday is inserted in the *Albion*, the *New York Gazette* and if possible in the *Courier* and *Enquirer*.

¹ The Ornithological Biography. These were sold at \$5.50 per volume.

² Dr. Nathaniel D. Potter of Baltimore. The account books show there was an N. Potter, who was a subscriber to the folio edition.

³ His son John Woodhouse Audubon.

⁴ Robert Meckle, born July 1, 1798, elected cashier of the National Union Bank of Baltimore in 1830, which position he held for forty-eight years. Subscriber to the 1840 edition.

⁵ G. S. Oldfield. Subscriber to the 1840 edition.

⁶ Frederick W. Brune, Sr., born 1776, died 1860. A successful German merchant and shipowner, officer and director in several banks and public institutions, enjoyed a high reputation for enterprise, liberality and honor. Subscriber to the 1840 edition.

John Christian Brune. A man of high commercial honor. Died Dec. 7, 1863. Subscriber to the 1840 edition.

⁷ In the account books is a memorandum that on Feb. 11, 1840, there was forwarded to Col. Theodore Anderson of Baltimore, one set of the large-work, half bound, fifteen volumes of the Biography, and thirty copies of the Synopsis.

⁸ Probably George S. Morris of Baltimore, who was a subscriber to the 1840 edition.

⁹ This paper was first issued Sept. 28, 1812. Two years later the name was changed to the Baltimore Patriot and Evening Advertiser.

I have sent one to Chevalier and another to Dr. Parkman.¹ I ought to have at this moment 300 copies Nos. 1, 2, 3, 4; for Washington City and I really think it would be better to stop the publication of the work for *one month* to effect this. Therefor loose no time in urging Mr. Bowen (write to him) and Chevalier also on this all important subject.

If ever I was in want of assistance it is at this moment and *you* my dear Victor must be on the alert and second my endeavors to render you all Happy! I would be delighted to have a few lines from dearest Mamma and Eliza at the end of your next letter, which I hope to receive in immediate answer to this, *Here*. I have marked all your items in your last letter. Call from time to time at the Mercantile Library. I am glad you have remitted to the Rathbone's.² Do write to Mr. Hoppenstall and see the daughter of Capt. Brittan. I was invited last evening to a great ball, and should have gone had not my accident of shin bones prevented me. I am told that I would have had some 20 names there.

Recollect that our agents name is Gideon B. Smith³ and a most worthy man he is, highly recommended by Robert Gilmor⁴ and others.

[This is one of the few Audubon letters which I have seen where the signature was omitted.]

¹ Dr. George Parkman, born 1791, died 1849. One of Audubon's warmest friends in Boston, assisting him in many ways. In a letter which Audubon wrote from London, Nov. 18, 1837, to Dr. Thomas M. Brewer, addressed to "My dear young friend," he says: "I send you enclosed the copy of an advertisement of my work, which I wish you to hand over to our most generous friend George Parkman Esq., M. D., and ask of him to have it inserted in one or more of the Boston newspapers as soon as convenient." The account books show that on Jan. 8, 1840, a box was shipped to Dr. Parkman, containing one set full bound of the large work, *Birds of America*, at \$1075; also one set half bound at \$950, and the *Biography* complete at \$27.50. Dr. Parkman was also a subscriber to the octavo edition of 1840, as well as to the work on the *Quadrupeds*.

² William and Richard Rathbone, the warmest friends Audubon had in England and whose acquaintance he first made in 1826. The "Flycatcher," a drawing made by Audubon in 1826 and presented to Mrs. Rathbone of "Green Bank," Liverpool, England, also the pencil sketch of Audubon drawn by himself, are still in the family. These were illustrated in 'Audubon and his Journals' and Miss M. R. Audubon writes me that she saw them during a recent visit to Liverpool. The Rathbone's still possess the folio edition of the 'Birds of America' with Audubon's presentation autograph in each volume.

³ Gideon B. Smith, M. D., born 1793, died 1867. M. D., University of Maryland, 1840. Editor *Journal of the American Silk Association*, 1839-40. A well known entomologist, authority on the seventeen year locust.

⁴ Robert Gilmor, died Nov. 30, 1848. Extensively connected with mercantile affairs. First President of the Academy of Sciences of Baltimore, when incorporated in 1825. An original subscriber to the folio edition, 'Birds of America,' as well as the octavo edition of 1840.

UNPUBLISHED LETTERS OF INTRODUCTION CARRIED BY JOHN JAMES AUDUBON ON HIS MISSOURI RIVER EXPEDITION.

BY RUTHVEN DEANE.

AUDUBON, like many other people, when travelling in foreign countries or going into new territory, supplied himself with letters of introduction, which always rendered him great assistance in his special objects, and made for him many life-long friends.

It was about a year before he started on the memorable Missouri River Expedition, that he began to correspond and talk up the trip with those whom he had selected to make up his party. At that time he secured letters of introduction and recommendation, but not knowing to whom they would be presented they were necessarily of the "to whom it may concern" type. The following five are of special interest, as they only show further evidence of the very high esteem in which Audubon was held by friends who were prominent in official positions. Copies of these letters were found in the Audubon account books, and I express many thanks to Mr. John E. Thayer, in whose possession they are, for the liberty of publishing them.

I.

United States of America,
Department of State.

To all to whom these presents shall come — greeting.

Know Ye, that the bearer hereof, John James Audubon, a distinguished naturalist and native citizen of the United States, has made known to me his intention of travelling on the continent with the view principally of aiding the cause of science by extending his researches and explorations in natural history, and as he is known to me to be a man of character and honor and worthy of all friendly offices and of all personal regard, these are therefore to request all whom it may concern, to permit him to pass freely, without let or molestation, and to extend to him all such aid and protection as he may need, and which becomes the hospitality of civilized and friendly nations.

In testimony whereof I, Daniel Webster,¹ Secretary of State of the United States, have hereunto set my hand and caused the seal of this department to be affixed at the City of Washington, this the 24th day of July, A. D. 1842.

II.

Washington, 24 July, 1842.

The bearer of this note is Mr. Audubon well known in the world as a very distinguished naturalist who has contributed largely to the amusement and instruction of those who take pleasure in his interesting pursuits, by his publications.

I understand that Mr. Audubon proposes visiting the western part of this great continent and possibly those regions where the British fur trade companies pursue their adventures.

Although the known kindness and hospitality of the managers of these companies render any recommendation or introduction of a gentleman so distinguished wholly useless, I beg to add my testimony of his great merit and of his deserving in every respect all assistance and support that may be given him, as well as for his own sake and for the sake of that science which he is so well qualified to improve and promote. I believe I may add that Mr. Audubon has no other motive whatever for his excursion but the pursuit to which I have alluded.

ASHBURTON.²

III.

Head Quarters of the Army,
Washington, July 25th, 1842.

To the Officers of the
United States Army,
Gentlemen,

This letter may be exhibited to some of you on the remote frontiers. Its object is to bespeak your kind aid and assistance in

¹ Secretary of State, 1841-43 and 1850-52. Born Jan. 18, 1782, died Oct. 24, 1852. A warm personal friend of Audubon, who aided him in many ways and was a subscriber to the folio edition of his 'Birds of America.'

² Lord Alexander Baring Ashburton, born 1774, died May, 1848. An English financier and diplomatist. Sent to the United States in 1841 on a special commission on the subject of a long disputed boundary between Maine and the British Colonies. Daniel Webster praised him highly as a good man to deal with, who could see that there were two sides to a question.

behalf of our distinguished countryman John James Audubon Esq., who is the author of the great work *The Birds of America*, and who is about to illustrate American Science by another, *The Quadrupeds of North America*. Mr. Audubon will probably be accompanied by his younger son,¹ and one or two other assistants.

The object of this note is to ask for the interesting party such courtesies and assistance as they may need in their labors, and which gentlemen of the Army themselves, scientific and liberal, cannot fail to render with pleasure.

With great respect

I remain

Gentlemen

Yrs. truly

WINFIELD SCOTT.²

By the General

R. Jones³

Adjt. Gen^l.

July 25th, 1842.

IV.

Mr. John James Audubon an eminent naturalist and an American citizen, being about to visit our frontiers, he is hereby recommended to the kindness of all who would promote the science of natural history by honoring and assisting one who has devoted himself to it with such ability and enthusiasm, and particularly to the hospitality and protection of all officers and Agents of the War Department, Civil or Military, who [are] specially desired to render to Mr. Audubon and his party any assistance, protection and comfort in their power, not inconsistent with their public duties.

JOHN C. SPENCER.⁴

War Department,

July 25th, 1824.

¹ John Woodhouse Audubon. He did not, however, accompany his father. The party was made up of Edward Harris, Isaac Sprague, John G. Bell, and Lewis Squires. The Expedition occupied the period between March 11, 1843, and Nov. 6, of the same year.

² General Winfield Scott, born June 13, 1786; died May 29, 1866. In 1841 he became Commander in Chief of the Army of the United States.

³ Roger Jones, born 1787, died July 15, 1852. He was appointed Adjutant General of the Army March 7, 1825.

⁴ John Canfield Spencer, born 1788, died May, 1855. Secretary of War from October 12, 1841, to March, 1843, when he became Secretary of the Treasury.

V.

United States of America,
Washington, 28th July 1842.

The bearer of this, John James Audubon, is a native citizen of the United States, who has informed me of his intention of travelling on the continent of America, chiefly to promote the cause of science by researches in natural history. He is known to me to be a naturalist of eminent acquisitions and estimation, a man of character and honor and worthy of all personal respect and regard. I recommend him to my countrymen abroad and to the authorities and inhabitants of other countries that he may receive the friendly offices, aid and countenance which are due to the interests of science and the rites of hospitality among civilized nations.

JOHN TYLER,¹

President of the U. States.

LIST OF THE BIRDS OF LOUISIANA. PART IV.²

BY GEO. E. BEYER, ANDREW ALLISON, AND H. H. KOPMAN.

64. ROSEATE SPOONBILL (*Ajaia ajaia*). The only locality in the State where this species is now positively known to occur is the region about Lake Arthur, in southwest Louisiana. Material collected in this locality in 1894 is now in the museum of Tulane University. Spoonbills are reported to be resident in the Lake Arthur region. Their nesting places are in the heavy river and lake swamps of Cameron and Calcasieu Parishes. Two specimens were shot on the Mississippi River about five miles below New Orleans in December, 1884.

65. WHITE IBIS (*Guara alba*). A common resident, especially in swampy sections of the southern part of the State. In the latter part of summer it is not an uncommon sight in the less settled portions of the State to see long files or irregular flocks of this species, containing about

¹ John Tyler, Tenth. President of the United States, born March 29, 1790; died January 18, 1862.

² For Parts I and II, see Volume XXIII, pp. 1-15, 275-282; for Part III, see Volume XXIV, pp. 314-321.

equal numbers of adults and young birds, moving at evening from the feeding grounds, and in the mornings returning from the roosts. Local (Creole) name: Beccroche (Crooked bill).

66. SCARLET IBIS (*Guara rubra*). The occurrence of this species in Louisiana as noted by Audubon is the only reliable record of which we have knowledge. A specimen in the State Museum in New Orleans prepared, by a New Orleans taxidermist, is said to have been killed in Louisiana about 1888, but the chain of testimony in this particular case is imperfect.

67. GLOSSY IBIS (*Plegadis autumnalis*). A resident in the same section as the Roseate Spoonbill, but not as common as the following species.

68. WHITE-FACED GLOSSY IBIS (*Plegadis guarauna*). Resident and breeding in southwest Louisiana. Several small flocks at Lake Prieu, Calcasieu Parish, in September, 1898 (Beyer).

69. WOOD IBIS (*Tantalus loculator*). Appears to be growing rarer every year. Occurs in the vicinity of heavy swamps in various parts of the State. Two nesting colonies of about 40 birds each were formerly observed in St. Tammany Parish on the Bedico and Bogue Chitto Rivers (Beyer), while it has been seen in summer in Cameron Parish, in southwestern Louisiana, and in Madison Parish, diagonally across the State. In the latter section there are some very deep swamps, and considerable numbers were noted there in July, 1896 (Kopman). The nests of the colonies noted in St. Tammany Parish were bulky and formed of large dry sticks, placed at an elevation of 25 or 30 feet, directly over a waste of mud and water. The flock composing one of these colonies was seen using two tall dead tupelos as roosting places later in the season, beginning about August 1. Wood Ibises were seen at Lake Catherine, La., in October, 1904.

70. AMERICAN BITTERN (*Botaurus lentiginosus*). Breeds in limited numbers; common as a winter resident. Local (Creole) name; Gaze-Soleil (Sun-gazer).

71. LEAST BITTERN (*Ardetta exilis*). An abundant resident in the marshes of the coast; more conspicuous, and doubtless more abundant, in summer than in winter. Has been noted also in summer about the marshy edges of heavy swamp lakes in northeastern Louisiana (Madison Parish). Nesting begins the latter part of April, in the latitude of the Gulf Coast. This species is commonest along the borders of bayous in the marsh.

72. GREAT BLUE HERON (*Ardea herodias*). A common resident in all sections of the State. It is most plentiful, of course, in marshy and swampy sections, and about large expanses of water. Large numbers are never seen in one locality as with the smaller herons.

73. AMERICAN EGRET (*Herodias egretta*). A resident, but less common in winter than in summer. Is growing less common. Occurs along the coast and at suitable localities inland.

74. SNOWY HERON (*Egretta candidissima*). It has been at least twenty years since this species has occurred in any considerable numbers. A few

pairs were seen on East Timbalier Island in June, 1907, where apparently they were breeding with the large colony of Louisiana Herons. East Timbalier is now a government reservation. A colony at Avery Island is given protection by E. A. McIlhenny. It is doubtful whether this species ever wintered in large numbers in Louisiana.

75. REDDISH EGRET (*Dichromanassa rufescens*). Rather common as a breeder along the coast, but disappearing more or less completely in winter.

76. LOUISIANA HERON (*Hydranassa tricolor ruficollis*). This species breeds chiefly in the grass and bushes of several islands off the Louisiana coast instead of in swamp "rookeries" on the mainland, as in the case of the other species. There are large colonies at East Timbalier and other islands. The colony at East Timbalier numbers about 1750. Nearly all stages of nesting were observed when this colony was visited early in June, 1907.

77. LITTLE BLUE HERON (*Florida carulea*). This is the commonest of the herons of Louisiana; in winter, however, it is almost entirely absent. It arrives at the latitude of the coast early in March. The flocks of returning migrants are usually small, and single birds are frequently seen. Long irregular flocks, with white birds usually preponderating, are seen traveling over well defined routes at the approach of autumn. The spring birds, when the species first returns, are most frequently seen on cloudy and windy days, traveling at a considerable height. This species is undoubtedly one of the commoner large migrants at night throughout much of the spring, especially on wet nights or when stormy weather prevails. The favorite resorts of the Little Blue Heron are heavy swamps rather than open marshes. Rookeries occur at various localities throughout the wetter parts of the State. One that lies a few miles south of New Orleans is situated where swampy woods give way to fresh water marsh. The nests are chiefly in willows. Yellow-crowned Night Herons are included in the same colony. Nesting is usually well under way by May 1.

78. GREEN HERON (*Butorides virescens*). The Green Heron does not arrive in Southern Louisiana in large numbers until the end of March. The migration appears to be performed entirely at night. Great numbers may usually be heard on wet or windy nights throughout April. This species is about as common in suitable localities inland as near the coast.

79. BLACK-CROWNED NIGHT HERON (*Nycticorax nycticorax naevius*). This species is commoner in winter than in summer, but it has been found breeding in the vicinity of Lake Maurepas (Beyer), and has been found on East Timbalier Island early in June (Kopman).

80. YELLOW-CROWNED NIGHT HERON (*Nyctanassa violacea*). Chiefly if not exclusively, a summer visitor, arriving the end of February or early in March, and being heard in night migration with the other herons throughout the spring. In summer, also, the voice of this bird may be frequently heard at night, movements to and from the feeding grounds apparently occurring with great frequency during the hours of darkness. The swamps

of the southern section of the State are preëminently the home of this species; it is most frequently found feeding on the borders of wet woods, but sometimes in their depths, as well as about canals and ditches on cultivated lands, and along bayous in the marsh. Local (Creole) name: Grosbec.

81. WHOOPING CRANE (*Grus americana*). A winter bird, visiting the coast in considerable numbers.

82. SANDHILL CRANE (*Grus mexicana*). Resident on the coast, frequently occurring there in large numbers.

83. KING RAIL (*Rallus elegans*). Chiefly a winter bird, but probably breeds in fresh or brackish marshes near the coast, and at suitable localities in the interior of the State, as about the marshy edges of the lakes and swamp sloughs in the north central and northeastern sections of the State.

84. LOUISIANA CLAPPER RAIL (*Rallus crepitans saturatus*). This is the common rail of the coast, where it is extremely abundant. It occurs in fresh or brackish marshes a short way from the coast as well as in marshes bordering directly on salt water. It occurs along the Mississippi River as far north as the upper quarantine station. Nesting begins fairly early and the young birds are out of the egg by the first of June or even earlier.

85. VIRGINIA RAIL (*Rallus virginianus*). A common winter visitor, frequenting almost any wet place where there is suitable cover. It has been seen at New Orleans as late as April 7. It arrives in southern Louisiana about October 1.

86. SORA (*Porzana carolina*). While not breeding in Louisiana, this species is very common there throughout a large part of the year. It reaches the rice fields, especially those along the lower course of the Mississippi, by the middle of August, and becomes very abundant in September. It winters in smaller numbers, and grows common again in spring. Most leave by the first week in April, but a few are seen until end of the month.

87. YELLOW RAIL (*Porzana noveboracensis*). Fairly common in winter, especially in rice fields. Birds of this species are sometimes caught by hunting dogs.

88. PURPLE GALLINULE (*Ionornis martinica*). Resident, but rare in winter. Commonest near the coast, being found along bayous through the marshes and swamps, about rice fields where the ditches and canals are fringed by heavy growths of weeds, rushes, and grasses, and even about the marshy edges of lakes and swamp sloughs in the interior of the State. The main body of this species in Louisiana is chiefly migratory, and in the case of the few resident individuals there is considerable local movement in winter. Nesting usually starts the latter part of April. Many nests with fresh eggs have been found on the Company's Canal, near New Orleans, on April 28. Local name: Blue Rail.

89. FLORIDA GALLINULE (*Galinula galeata*). While occurring in the same localities as the Purple Gallinule, this species is found more in open marshes where the cover is not so dense than in places frequented by the Purple Gallinule. However, it has been found nesting commonly in

marshy growths about the edges of swamp sloughs in northeastern Louisiana. About little pools in the marshes to the east of New Orleans, especially about Lake Borgne, Lake Catherine, etc., this species may frequently be taken unaware while swimming or walking over the muddy edges to the pools. As many as 8 or 10 together may sometimes be seen under these circumstances. The nesting of the Florida Gallinule appears to occupy about the same period as that of the Purple Gallinule. Fresh eggs may be found as late as July 1. The numbers of this species are much reduced in winter. Local (Creole) name: Ralle Poule d'eau.

90. AMERICAN COOT (*Fulica americana*). Very abundant in winter, and a few may breed. Individuals have been seen as late as May 18, with Blue-winged Teals. Unobstructed water surfaces are preferred by this species. It reaches southern Louisiana in large numbers about Oct. 1. The majority leave before the middle of March. Local (Creole) name: Poule d'eau.

91. WILSON'S PHALAROPE (*Steganopus tricolor*). Rather an unusual migrant.

92. AMERICAN AVOCET (*Recurvirostra americana*). A migrant only. A specimen was taken on Bayou St. John, near New Orleans, Nov. 12, 1889, at almost the identical spot where Audubon took one of his specimens (Beyer).

93. BLACK-NECKED STILT (*Himantopus mexicanus*). Resident, but commoner in winter. It is found rather generally in open wet places in the southern section of the State, but never in large numbers.

94. AMERICAN WOODCOCK (*Philohela minor*). Fairly common in suitable localities in winter, but growing steadily less so; it has been found breeding in the State. A young one was retrieved by a dog near Covington on January 29, 1890. Mating birds had been observed during the middle of January near Madisonville (Beyer). Local (Creole) name: Bécasse.

95. WILSON'S SNIPE (*Gallinago delicata*). Most abundant during spring and fall. Its occurrence during winter is extremely irregular; occasionally it is found in considerable numbers in either December or January. The greatest numbers are present during October and part of November and again after the middle of February until the early part of April. The heaviest migration usually occurs the latter part of March. A few are seen even until the early part of May. Returning individuals may be found by September 1 or even earlier. Open marshes, wet pastures, and rice fields are the favorite resorts of this species in Louisiana. Local (Creole) name: Bécassine.

96. DOWITCHER (*Macrorhamphus griseus*). Associated with the following, but not so common.

97. LONG-BILLED DOWITCHER (*Macrorhamphus scolopaceus*). Abundant as a winter resident along the coast and in other suitable localities. This species arrives from the north by August 15 or earlier. Lingered individuals have been seen on the coast until the early part of June, and it is not only probable but practically certain, as in the case of various

other species of Limicolæ, that non-breeding individuals are present in Louisiana all summer. Local (Creole) name: Dormeur.

98. STILT SANDPIPER (*Micropalama himantopus*). Has not been observed in recent years. Specimens have been taken during migration in the past.

99. KNOT (*Tringa canutus*). This species is rare in Louisiana. Specimens in the Kohn collection at Tulane University, New Orleans, were taken at Grand Isle March 28 and April 2.

100. PECTORAL SANDPIPER (*Actodromas maculata*). A very common migrant, occurring in wet pastures as well as on mud flats along the coast and in the marshes. Arrives at the latitude of New Orleans the first week in March, and is present in large numbers late in March and early in April, while it continues present in limited numbers even until May 15 or 20. Returns to Louisiana during the latter part of July. The fall migration is usually completed by October. Local name: Cherook.

101. WHITE-RUMPED SANDPIPER (*Actodromas fuscicollis*). Its movements agree rather closely with those of the preceding, but it is not very common except on the remoter islands of the coast, as Chandeleur, Breton, East Timbalier, and Last Island, where shore birds of all descriptions abound in migration, and where some kinds not breeding in Louisiana may be seen throughout the summer. The White-rumped Sandpiper has been seen on East Timbalier early in June.

102. BAIRD'S SANDPIPER (*Actodromas bairdii*). An uncommon migrant.

103. LEAST SANDPIPER (*Actodromas minutilla*). Very common during migration, arriving usually in August, being found sparingly in winter, and lingering until late in spring. It is a bird of the coast rather than of inland waters and wet places in the interior.

104. RED-BACKED SANDPIPER (*Pelidna alpina sakhalina*). Occurs in winter, as well as during the migrations, along the coast, and has been taken at Freshwater Bayou, Calcasieu Parish, in January (Beyer). Has been noted at Cameron, in the same parish, as late as May 25 (Kopman).

105. SEMIPALMATED SANDPIPER (*Ereunetes pusillus*). A very common migrant, especially on the coast. It returns from the North in considerable numbers by the end of July; but does not appear to linger so late in spring as the Least Sandpiper.

106. SANDERLING (*Calidris arenaria*). A rather common migrant, found chiefly or entirely along the coast. Migrants return from the North early in August. Has been seen at Cameron on June 30, but the individuals noted in this case were doubtless non-breeding birds that had been present since spring. Lingers in the spring, and has been seen during the last of May.

107. MARBLED GODWIT (*Limosa fedoa*). Not especially common; chiefly a migrant, but also found on the coast in winter.

108. HUDSONIAN GODWIT (*Limosa hæmastica*). Not common; specimens in the Kohn collection were taken at Vinton, Calcasieu Parish, on April 22, 1895, and at New Orleans, September 27, 1895.

109. GREATER YELLOW-LEGS (*Totanus melanoleucus*). Occurs in winter as well as during the migrations; often found in large numbers on the coast. Local name: Klook-klook.

110. YELLOW-LEGS (*Totanus flavipes*). Movements about the same as those of the preceding species, but wintering in smaller numbers. Migrants appear in Louisiana early in March, and are commonest the latter part of that month and for a while in April. It returns to Louisiana about August 1. Local name: Klook-klook.

111. SOLITARY SANDPIPER (*Helodromas solitarius*). Very common as a migrant throughout the State, especially in the lowlands. The earliest date of arrival at New Orleans in spring is March 9, and the average date is March 15. It becomes very common by April 1 or even earlier, and is seen in numbers until the latter part of the month, and has been seen as late as May 6. The return of this species has been noted on July 9; it is extremely common in August and for the first half of September.

112. WESTERN WILLET (*Symphemia semipalmata inornata*). A common resident on the coast, especially in the southwest. On the marsh prairies in Calcasieu Parish it is extremely tame.

113. BARTRAMIAN SANDPIPER (*Bartramia longicauda*). Not known to breed in Louisiana, but it is present until late in the spring (May 19), and returns by the middle of July. It does not winter, and disappears by the middle of October or earlier. The first in spring has been noted at New Orleans on March 9. It is common by April 1 or earlier. It is found chiefly in fields and pastures. It is much esteemed as a game bird and goes locally by the name "Papabotte."

114. BUFF-BREASTED SANDPIPER (*Tryngites subruficollis*). Occurs as a rare migrant, said to be more common in winter on the coast. Two specimens were taken from a flock of eight on the outskirts of New Orleans in October, 1887. Other specimens have been taken in October.

115. SPOTTED SANDPIPER (*Actitis macularia*). Common as a migrant, breeding in limited numbers, and possibly wintering in small numbers. Its migrations begin later in spring than those of most of the other species. It is not usually seen at New Orleans until April, and is commonest after the 10th or 15th of that month, disappearing more or less completely by the early part of May; it has been found breeding, however, on several of the drainage canals about New Orleans (Beyer). It is common as a migrant again by the end of July, and so remains until the middle or latter part of September.

116. LONG-BILLED CURLEW (*Numenius longirostris*). Probably breeds on the Louisiana coast in limited numbers; has been seen at Cameron on July 1. It is common at some coast localities in winter.

117. HUDSONIAN CURLEW (*Numenius hudsonicus*). Winters sparingly on the coast and is rather common as a spring and fall migrant. Has been noted at Sabine Pass as late as May 20 (Kopman).

118. ESKIMO CURLEW (*Numenius borealis*). A migrant only, now rare if not absent, but formerly common for a short while in spring and fall.

119. BLACK-BELLIED PLOVER (*Squatarola squatarola*). Common on the coast during migration, having been noted on Timbalier Island in March, and as late as the first of June. It has been found in considerable numbers on Grand Island in August and September.

120. GOLDEN PLOVER (*Charadrius dominicus*). The principal migration of this species in spring occurs between April 1 and April 15, though individuals have been seen on the coast during the late spring and early summer; the latest date recorded is Shell Islands, off Bastian Bay, June 10, 1907 (Kopman). In fall it has been seen on Grand Island in considerable numbers in September.

121. KILLDEER (*Oxyechus vociferus*). Breeds in Louisiana in limited numbers, even in the southern part of the State. Abundant in winter; numbers reach the southern part of Louisiana about Nov. 1, the first migrants arriving about Oct. 10. Few are to be found in the southern part of the State after March 10.

122. SEMIPALMATED PLOVER (*Ægialitis semipalmata*). Common during migration, especially along the coast, and wintering there in smaller numbers; the spring migration occurs chiefly during April; the return from the north occurs the latter part of July.

123. PIPING PLOVER (*Ægialitis meloda*). A rare migrant. One specimen was obtained on Lake Pontchartrain in October, 1893 (Beyer).

124. BELTED PIPING PLOVER (*Ægialitis meloda circumcincta*). A common migrant on the coast, especially on the chain of islands from Last Island to East Timbalier. This species has been observed on these islands through a considerable part of June. It frequents the sandy parts of such islands beyond the reach of the tide. In such locations it is the most conspicuous bird figure, and its notes may be heard almost continuously.

125. SNOWY PLOVER (*Ægialitis nivalis*). Fairly common in some seasons on Grand Island and similar islands during migration.

126. WILSON'S PLOVER (*Ochodromus wilsonius*). The Louisiana coast lacks the favorite situations of this species — the beaches of "sharp" white sand, such as occur on the eastern Gulf Coast; and consequently the Wilson's Plover is found in rather small numbers along the Louisiana Coast. It is probably resident wherever occurring.

127. TURNSTONE (*Arenaria interpres*). A rather common resident on the coast.

128. AMERICAN OYSTERCATCHER (*Haematopus palliatus*). Is growing constantly rarer. The last seen were noted at Grand Island Sept. 9, 1900 (Beyer).

THE PASSENGER PIGEON (*ECTOPISTES MIGRATORIUS*) IN CONFINEMENT.

BY RUTHVEN DEANE.

IN 'THE AUK' (Vol. XIII, 1896, p. 234), I published an account of 'The Passenger Pigeon in Confinement,' based on a flock of fifteen birds, some of which had been in possession of Mr. David W. Whittaker of Milwaukee, Wis., for several years. Mr. Whittaker raised this flock from a pair of young birds which he received from a young Indian who trapped them in Shawano County in northeastern Wisconsin.

Between the time of my inspection of the pigeons (March 1, 1896) and the spring of 1897, the whole flock was purchased by Prof. Charles O. Whitman of the University of Chicago, but the following year he returned seven of the birds to Mr. Whittaker. My sincere thanks are due to Prof. Whitman for furnishing me with the following detailed memoranda of the increase and decrease of the flock which remained in his possession until the winter of 1907, when the last bird died.

"1896.— On March 14, purchased three Passenger Pigeons from David W. Whittaker of Milwaukee, Wis. (1♂, 2 ♀). In October purchased another pair from the same flock.

"1897.— In March purchased the balance of the flock consisting of ten birds, thus giving me the entire flock of fifteen birds. During this year nine young were hatched but only four lived, giving me a flock of nineteen.

"1898.— Gave seven birds back to Mr. Whittaker and from the twelve remaining five eggs were hatched, but only two of the young lived, leaving me with a flock of fourteen.

"1899.— Fifteen eggs were laid from February 24 to April 17, but none of these hatched, although five or six developed to the point of hatching. From April 21 to 23, four more eggs were laid and three of these hatched, but the young all died. May 28, took the flock to Woods Hole, Mass., but no more eggs were laid; thus 1899 proved fruitless.

"1900.— During this year fewer eggs were laid and not a single young was raised.

"1901.— Between April 24 and August 25, seven eggs were laid and all of these hatched, but two died. During the latter part of this year three grown birds died.

"1902.— Started the year with a flock of sixteen birds (8 ♂, 8 ♀). Six eggs were laid, one hatched May 29, the young living until October 21. Two old birds (♀) escaped from the pen while at Woods Hole, Mass., and one (♀) was sent to the Gardens of the Cincinnati Zoölogical Co., leaving a flock of thirteen birds (8 ♂, 5 ♀).

"1903.— The birds began mating in January. Two males died of tuberculosis, leaving six males and five females. Only one pair mated and built a nest, but the female produced no egg.

"1904.— Some nests were again made, no eggs being deposited, however. One pair laid twice but the eggs developed for only a few days, then halted. Evidently this means that the stock is getting weak. During the year four males and one female died, leaving a flock of six (2 ♂, 4 ♀).

"1905.— One nest built but no egg laid, the female had evidently lost her power to produce even an unfertile egg. Another female, by the same male, produced a good egg which hatched under a pair of hybrids, but the young lived only twelve days.

"1906.— Two males and two females died, reducing the flock to two females.

"1907.— The two remaining females died of tuberculosis during the winter. I have two male hybrids, between a male Passenger Pigeon and the common cage Ring Dove (*Turtur risorius*). So far as tested, these hybrids have proved unfertile."

Of the seven birds returned to Mr. Whittaker in 1898, four males are still alive, and on October 25, 1907, I visited Milwaukee for the express purpose of again seeing these birds.

For some time they have been in charge of Mr. A. E. Wiedring, to whom I am much indebted for courtesies and information. I found two of the birds in fine plumage, the other two not having quite completed the moult. Mr Wiedring stated that they were apparently in a healthy condition and that he fed them almost entirely upon seeds and farinaceous food. In the spring he frequently fed them on angleworms, of which they are particularly fond, and in this respect differ entirely from the domestic pigeons. The only remaining female of the flock died the previous year,

probably of tuberculosis. In a letter from Mr. Wiedring under date of Feb. 13, 1908, he informs me that the pigeons have been in good condition since my visit the previous October, and that in about a month the birds will begin to get very restless, which is ascribed to the approaching breeding season.

For years we have known of the Passenger Pigeons in the Gardens of the Cincinnati Zoölogical Co., and I am much indebted to Mr. S. A. Stephan, General Manager, for the following report of their flock, in a letter written November 9, 1907.

"The original flock, which came from Michigan in 1875, consisted of twenty-six birds, about half males and half females. A short time later, however, five or six of these escaped. They have bred from time to time and we have raised about twenty-three birds. In no instance has more than one egg been deposited at a time. At the present time our flock has been reduced to three, one male from the original flock, now about twenty-three years old, one male, which we raised, is about eighteen years old, and one female that we obtained from Prof. Whitman's flock in 1902, which is about twelve years old. We have never detected any particular disease which has caused the decrease of the flock, but have attributed it in most cases to old age."

The remnants of the Milwaukee and Cincinnati flocks now number but seven birds (6 ♂, 1 ♀) with little or no chance of any further reproduction.

As a sufficient time has now passed since there has been an undisputed record of a flock, or even a single bird, having been seen, those who have given this subject much attention, are forced to believe that this noble bird, in its wild state, is now extinct. Every little while reports appear in the press or sporting papers, that our Wild Pigeon has again been seen, but we have no specimen or facts to verify the record. How many times have I run down some of these reports, only to find them to be cases of either mistaken identity—Turtle Doves—or humbugs. It is hard to believe that this bird, which within a comparatively short time traversed the country in countless numbers, has been wiped off the face of the earth through the agency of man, yet when we read the mass of evidence which Mr. W. B. Mershon has brought together in 'The Passenger Pigeon,' of the wholesale slaughter which has been going on for so many years, we stop and wonder.

RANDOM NOTES ON THE DISTRIBUTION OF SOME
COLORADO BIRDS, WITH ADDITIONS TO THE
STATE AVIFAUNA.BY HORACE G. SMITH.¹

SINCE the publication of Prof. W. W. Cooke's 'Birds of Colorado' some additional information has been obtained relative to the distribution and breeding habits of some species whose range at that time was but little known, so far as the State of Colorado was concerned.

Through connection with the State Historical and Natural History Society, the writer has had opportunities, both to collect and examine a number of specimens from various localities within the State, and presumes the following notes will be of interest to bird students at this time. Unless otherwise stated, the specimens referred to were donated to the museum by the persons whose names appear in connection with the information given. Others were taken by Curator William C. Ferril and the writer, while on short collecting trips, and in this connection it may be well to state that usually but one to three days were spent in any one locality. Had time been available for more continuous and thorough work, additional facts would doubtless have been secured. My thanks are due Prof. Robert Ridgway of the National Museum, also to members of the staff of the Biological Survey, who kindly examined some of the more difficult subspecies.

Harelda hyemalis. OLD-SQUAW.—Three more specimens, now in the State collection, may be recorded for the State. One was shot at Loveland, Colo., Oct. 16, 1898; another at Calkins Lake, near Longmont, Oct. 23, of the same year. Both were probably males and were taken by Mr. Bryan Haywood. A later specimen, a male, was secured by Judge Park, at Longmont, about Nov. 20, 1903.

Oidemia deglandi. WHITE-WINGED SCOTER.—A male was taken at La Salle, Weld Co., Oct. 24, 1904, and presented to the museum by Mr. H. G. Clark.

Oidemia perspicillata. SURF SCOTER.—Two specimens, both males,

¹ Assistant Curator, State Historical and Natural History Society, Denver, Colorado.

were donated to the museum, one having been taken by Mr. L. B. Meek, at Barr, Adams Co., Oct. 22, 1899; the other secured at Loveland, Larimer Co., by Mr. H. A. Fynn, Oct. 31, 1899.

Nycticorax nycticorax naevius. BLACK-CROWNED NIGHT HERON.—Early in January, 1903, Mr. T. L. Monson brought in a young male of this species, which he shot from a tree near Fort Lupton, Weld Co., some time between December 20 and 24, 1902. Mr. L. J. Hersey, who has had much experience with this species at Barr Lake, Colo., has no fall records later than October, except in case of crippled birds. In preparing this specimen the writer made special search for casualties of this kind, but found none. Though the bird had not moulted, it was fat and in good condition. The stomach was empty.

Strix pratricula. BARN OWL.—Two more captures for the State may be recorded, both being females. The first was shot from the balcony of the State House, by Patrick Boyle, head janitor of the building, March 29, 1907, and presented to the State Historical Society. A short time previously Mr. Boyle called my attention to some "pellets" which were scattered about the upper balconies. Explanation of their tell-tale presence, supplemented by suggestions to be on the watch for the owl, resulted in its capture. The second specimen was shot by the writer at Holly, Prowers Co., May 24, 1907. It was startled from its roosting place in thick brush on the Arkansas River. The stomach contained the remains of a small rodent.

Otus asio maxwelliae. ROCKY MOUNTAIN SCREECH OWL.—In 1905, while stopping with the family of Mr. H. D. Boyes on Dry Willow Creek, Yuma Co., we learned that a small eared owl had reared a brood of young in a hole in the perpendicular bank of the creek, about half a mile from the farm house. Accordingly on our trip in 1906 we made special search in hopes of securing specimens which would decide the question as to the variety to be found here. On June 9, a male was secured while roosting under the upturned roots of a large fallen cottonwood tree. The latter was examined by both Mr. H. C. Oberholser and Prof. W. W. Cooke, the latter writing me that it is quite typical of the above subspecies.

Dryobates villosus villosus. HAIRY WOODPECKER.—On June 9, 1906, the writer took a pair of this species near Boyes's Ranch, Dry Willow Creek, Yuma Co., which, so far as we know, are the first records for the State. The actions of the birds, as well as the state of plumage, bore evidence that they were nesting in the neighborhood, but as it was then growing late, search for the nest on that day was impossible. The writer intended to return later and make thorough search, but unfortunately had to leave the locality before doing so. At least one other specimen was afterward seen, about half a mile from the first locality. The skins were sent to the Biological Survey for verification, and were so marked by Mr. Oberholser, who, Prof. Cooke informs me, pronounced them, "nearer the eastern than the Rocky Mountain bird."

Myiarchus cinerascens. ASH-THROATED FLYCATCHER.—A young male

was taken by the writer at Pagosa Junction, Archuleta Co., August 8, 1904. The plumage would indicate that it was probably reared in the neighborhood, but further search was impossible, owing to my leaving the place soon afterward.

Pica pica hudsonica. BLACK-BILLED MAGPIE.—Col. N. S. Goss, in his 'Birds of Kansas,' records this species as "an occasional fall and winter visitant in western Kansas." We have records from several points near the eastern State line of Colorado, Mr. Ferril, Curator of this society, having seen three at Julesburg, Sedgwick Co., Feb. 22, 1907, and later on Sept. 19, saw two in company with Blue Jays. Mr. H. D. Boyes tells me a pair was occasionally seen the past winter, near his ranch on Dry Willow Creek, south of Wray, Yuma Co. This is its first appearance according to his experience during a residence of about 20 years at that place. The writer several times saw half a dozen or more at Holly, Prowers Co., while collecting there the last week in December, 1907, and the remains of others have previously been seen in the brush heaps of wood rats at this locality.

Cyanocitta cristata. BLUE JAY.—Some additional knowledge of this species has been gained since the records from Yuma Co., given in 'The Auk' (Vol. XXII, p. 81, 82). The writer has taken other specimens at Wray, and has since found it much more common at Dry Willow Creek, southeast of that place, where specimens were also taken. Several nests were seen in the tall cottonwoods surrounding the home of Mr. H. D. Boyes, and as a matter of fact, half a dozen nests to the mile, usually covered by incubating birds, could be seen up and down the creek, the first week in June, 1905.

Two sets of eggs were taken June 4, 1905. One nest about seven feet from the ground in a dead black willow, overgrown with grape vines, contained five slightly incubated eggs; the other about 25 feet up in a cottonwood tree, held four eggs in which incubation had progressed about one fourth. The birds were flushed in both instances. Mr. Boyes informs me that the species was not uncommon about the ranch the past winter.

It is also found in other eastern counties of the State, Mr. Ferril having shot two from a flock of half a dozen at Julesburg, Sept. 19, 1907. He was also told that it bred there. In the southeastern portion of the State, it is apparently less common. The writer saw one southwest of Holly, Colo., in the forenoon of May 24, 1907. In the afternoon of the same day a female was shot about a mile from the same locality near town, possibly the same bird.

Dolichonyx oryzivorus. BOBOLINK.—We have a male, taken in Middle Park, near the Troublesome River, by the late Prof. A. M. Collett, on July 11, 1897.

Icterus spurius. ORCHARD ORIOLE.—May 28 to June 9, inclusive, 1905, the writer made collections in Yuma County. June 3-9 were spent at Boyes's ranch on Dry Willow Creek, some ten or twelve miles southeast of Wray. Among the surprises met with in this region was the Orchard Oriole, which was found to be quite common and apparently breeding.

The males were seen daily, and heard in full song, in every grove; the females were less often noticed, possibly on account of their less conspicuous plumage, or because incubating.

A female was seen carrying nesting material, but as she flew quite a distance the location of the nest was not discovered. Several males and one female were taken. June 5-15, 1906, again found the writer in the county, part of the time being spent with Mr. Boyes. The experiences of the preceding year were repeated with additional information on nesting, several nests being discovered among the topmost branches of the trees, where they were quite inaccessible. Further specimens were also taken. Although Curator Ferril and the writer have spent considerable time in the vicinity of Wray, during the migrations, the species was only met with in the locality mentioned.

Icterus galbula. BALTIMORE ORIOLE.—In the same locality and under similar conditions, this species was also found by the writer, two males having been taken near Boyes's ranch, June 4 and 5 respectively, 1905. Females were also seen but not secured. In 1906 several pairs were seen, and a few hours watching was rewarded by the discovery of a nest, containing five recently hatched young and one egg, which, together with the female parent were taken June 14, 1906, and are now in the State collection. The male was seen at the nest but escaped capture. Our experience would indicate that the species was a not uncommon resident on Dry Willow Creek, Yuma Co., during the years 1905 and 1906, and in all probability may be found there every summer.

I may add that Bullock's Oriole is common there also, which fact made it quite difficult to estimate the relative abundance of the two species, the more so as they usually kept in the higher branches of the taller cottonwood trees, which were kept in motion by a stiff breeze that prevailed most of the time during my stay there. This I believe is the first authentic breeding record for Colorado.

Coccothraustes vespertinus montanus. WESTERN EVENING GROSBEAK.—As the breeding range of this species in Colorado is not yet well defined, it may be well to mention a brood of four or five, just out of the nest, that were seen by Howard S. Reed, July 22, 1898, in "California Park, Elk Head Mountains, Routt Co., Colo." One of the family was taken, and is now in Mr. Reed's collection.

Zonotrichia querula. HARRIS'S SPARROW.—A female, shot by W. C. Ferril, October 9, 1907, about two miles east of Kit Carson, Cheyenne Co., along the line of the Union Pacific Railway track. It was in company with a small party of Western Tree Sparrows, Western Vesper Sparrows, etc., and the only one seen. They were near a culvert and probably attracted by a patch of rank weed vegetation, which had grown up at that point.

Junco hyemalis oregonus. OREGON JUNCO.—A specimen of this variety was taken by the writer on the Platte River near Denver, Oct. 16, 1885, and subsequently sent to Prof. Robt. Ridgway, who verified the

identification. Later (after the habitat of this subspecies was restricted to the Pacific Coast), the specimen was shown to Prof. W. W. Cooke, who probably thinking it would, at that time, be referred to *connectens*, made no mention of it in his 'Birds of Colorado'. This disposal of it did not satisfy the writer, however, who quite recently again sent it to the National Museum, at the same time calling attention to the restriction in habitat which had taken place since the original examination. In due time the specimen was returned still bearing the above cognomen.

***Junco montanus*.** MONTANA JUNCO.—In a large series of Colorado Juncos, we find a number that are evidently referable to this species. A few of these were selected and sent to Prof. Robt. Ridgway for further examination, and specimens from the following localities were identified by him as this species. These are a pair taken by the writer on the Platte River near Denver, Dec. 3, 1885, and March 23, 1892, respectively. Two females taken on Clear Creek, near Denver, by Curator Ferril, April 2, 1901, and a male taken at Ralston Creek, Jefferson Co., by Ralph Smith, Feb. 22, 1895. We believe it is quite common at these localities, both as a migrant and winter resident.

***Pipilo fuscus mesoleucus*.** CAÑON TOWHEE.—In a small collection of birds made by Howard S. Reed, the writer had the pleasure of examining a specimen of this subspecies, shot near Boulder, Colo., March 17, 1895. So far as I know this is the most northern record of the variety in Colorado; other recorded captures having come from the Arkansas Valley in Pueblo County. In this connection it might be well to mention the taking of several specimens by Curator Ferril at Las Animas, Bent Co., on April 27, 1907, which would seem to extend its range somewhat to the eastward. In 1906 the writer also took two males at Watervale, Las Animas Co., Aug. 7 and 8, respectively, and saw several others while there.

***Guiraca cærulea lazula*.** WESTERN BLUE GROSBEEK.—Since recording this bird at Wray (Auk, Jan. 1905, p. 82), we have found it to be a not uncommon summer resident in eastern Yuma Co. The writer came upon a young brood not yet able to fly, near Boyes's ranch, Dry Willow Creek, June 5, 1905. The parents were feeding them at the time. The species was not uncommon, both here and in the vicinity of Wray. The dates of a number of specimens taken from 1904 to 1906, inclusive, vary from May 21 to June 15.

***Cyanospiza cyanea*.** INDIGO BIRD.—A female was taken by Curator Will C. Ferril, at Hugo, Lincoln Co., Colo., June 9, 1906, and is now in the Historical Society's collection.

***Spiza americana*.** DICKCISSEL.—Not uncommon summer resident at Wray, Yuma Co., where my attention was first called to them by Mr. W. E. Wolfe, who kindly drove me out to a certain field where they were apparently breeding.

One male was taken June 2, 1905, and two others on June 15, 1906. Their songs are not uncommon in the fields in the vicinity of town, where they doubtless nest; in fact, the writer marked several areas in which nests

were presumed to be located, but owing to stress of other matters, time was not taken to search carefully for them. The females were not often seen and were doubtless incubating. Also heard in the fields near Boyes's ranch some ten or twelve miles south of Wray.

Piranga erythromelas. SCARLET TANAGER.—An adult male was taken by Mr. W. C. Ferril at Palmer Lake, Colo., May 17, 1902, and was mounted by the writer. A second specimen, also an adult male, was taken at Pueblo, Colo., May 20, 1904, by Mr. B. G. Voight, who kindly donated it to the State Museum.

Vireo olivaceus. RED-EYED VIREO.—Two additional captures of this species may be given, the first a male, taken by Mr. L. C. Bragg at Boulder, Colo., May 30, 1904, and afterward kindly donated to the society. The second, also a male, was taken by Mr. W. C. Ferril at Wray, Yuma Co., May 26, 1906.

Lanivireo solitarius cassini. CASSIN VIREO.—This species was first definitely recorded for Colorado in the 'Nidologist,' Vol. III, p. 76, a female having been taken by myself at Aurora, near Denver, May 13, 1888. This, however, was not the first specimen taken by the writer, as a recent examination of the vireos in my collection, now the property of the State Historical Society, disclosed two others which, being fall specimens and in obscure plumage, were previously overlooked. The first, a male, was taken on the Platte River near Denver, Sept. 16, 1884; the other (sex?) Sept. 9, 1887, near Creswell, Jefferson Co., Colo. Both were recently identified by Mr. H. C. Oberholser.

Vireo bellii. BELL'S VIREO.—Since the records of specimens given in 'The Auk' (Jan., 1905, p. 82), taken near Wray, Yuma Co., in 1904, the writer has had further experience with this species, having again found it common, locally, around Wray in 1905 and 1906, specimens being taken as late as June 15 in the latter year. Also common on Dry Willow Creek, in the southeastern part of the county, where two males were taken June 9 and 11 respectively.

August 31, 1905, a family was seen at Julesburg, Sedgwick Co., one of which was taken. From May 22 to 25, 1907, they were quite common at Holly, Prowers Co., where the writer took a male on the 22d and a female the following day. The species was in full song and one of the most characteristic vocalists of the willow thickets.

Vireo vicinior. GRAY VIREO.—May 16 to 27, inclusive, 1907, the writer made collections in the Arkansas Valley between Manzanola, Otero Co., and Holly, near the State line in Prowers Co. May 16 to 20, inclusive, was spent at Lamar, at which place four specimens of this southern species were taken, which prove to be the first records for the State. The first male was taken May 16, one female on the 18th, and the other two, a pair, on the 20th. All were shot within a few yards of the same spot — used as a general dump ground — in a small grove on the Arkansas River north of town. Possibly the greater abundance of insects in this locality was the attraction for them. Special search at the other places visited, namely:

Holly, Prowers Co.; Prower, Bent Co.; La Junta and Manzanola, Otero Co.; but no other specimens were seen. Prof. W. W. Cooke writes me that, "The nearest previous record is in New Mexico, not far from Las Vegas." Specimens were examined by members of the Biological Survey.

Mniotilta varia. BLACK AND WHITE WARBLER.—One seen by the writer at Holly, Prowers Co., Colo., May 23, 1907. Observed for a few moments, but a few yards away, climbing about on the trunk of a cottonwood in the manner peculiar to the species, and under circumstances which preclude the possibility of misidentification.

Helminthophila peregrina. TENNESSEE WARBLER.—It was common during my stay at Holly, Prowers Co., from May 22 to 25 inclusive, 1907, at which time several were often seen together in company with other warblers. Two males were taken May 22 and 23 respectively. A day spent at Manzanola, Otero Co. (May 27), revealed several specimens, a male being taken. About the same time Mr. Ferril, while collecting at Julesburg, Sedgwick Co., took a male, May 21, and saw several others. Later, on the 27th, he took specimens at Kit Carson, Cheyenne Co., where it was not uncommon, being associated with Black-poll Warblers. From the above it would appear that the species was well represented during the spring migration of 1907, over the whole of eastern Colorado.

Compsothlypis americana ramalinæ. WESTERN PARULA WARBLER.—The writer took a female, May, 1904, on Clear Creek, near Denver, Colo., just over the line in Jefferson Co. Another specimen, also a female, was taken by W. C. Ferril from a flock of about a dozen, at Kit Carson, Cheyenne Co., Colo., May 27, 1907. Both were later examined by Mr. H. C. Oberholser of the Biological Survey.

Dendroica caerulescens. BLACK-THROATED BLUE WARBLER.—Sept. 18, 1903, saw a beautiful male, from the second floor of the hotel in Wray, Yuma Co. The bird was in a cottonwood tree opposite the window and about 10 feet from the writer.

Dendroica coronata. MYRTLE WARBLER.—One shot by the writer at Holly, Dec. 31, 1907. So far as we know this is the first winter record for Colorado. The bird was in the underbrush near the Arkansas River and entirely alone.

Dendroica maculosa. MAGNOLIA WARBLER.—A male taken at Holly, Prowers Co., May 22, 1907, is now in the Historical Society collection.

Thryomanes bewickii leucogaster. BAIRD'S WREN.—A female was taken by the writer May 23, 1907, at Holly, Prowers County. This is apparently the most eastern record for the State.

Poliophtila cærula obscura. WESTERN GNATCATCHER.—Three males of this subspecies, which are apparently the first records for Colorado, were taken by Mr. W. C. Ferril at Grand Junction, Mesa Co., May 17, 1906. Mr. Ferril's attention was first called to them by hearing unfamiliar call notes, which upon investigation proved to come from this species, which he soon found was not uncommon in the shrubbery near the confluence of the Gunnison and Grand Rivers. Many specimens were seen during the

day, both singly or in small parties of three or four, associated with warblers and other species common in the locality. Specimens were examined by members of the Biological Survey.

Sialia sialis. BLUEBIRD.—The experience of Curator Ferril and the writer would indicate that the Bluebird is not uncommon in eastern Colorado, from the northern boundary of the State to as far south at least as the Arkansas River. It was observed by Mr. Ferril at Julesburg, Sedgwick Co., May 21, 1907; it also has been seen by Mr. W. E. Wolfe and the writer at Wray, Yuma Co., in May. Mr. Ferril took two males and saw one other at Kit Carson, Cheyenne Co., May 26, 1907. The writer found it breeding at Holly, Prowers Co., May 22, and took a pair at Prowers, Bent Co., May 25, 1907. The writer observed it at Denver years ago and there is a female in the collection taken by the Curator at Arvada, Jefferson Co., May 27, 1902.

A PRELIMINARY LIST OF THE BIRDS OF SHANNON AND CARTER COUNTIES, MISSOURI.

BY E. SEYMOUR WOODRUFF.

THE following list of birds is the result of daily observations by the writer, made for the most part in the early morning hours, during a three months' stay in the Ozark Mountains of Shannon and Carter Counties, Missouri, from March 7 to June 8, 1907.

This interesting section of southern Missouri has hitherto been almost completely neglected by ornithologists. It accordingly is deemed advisable to publish a list of the birds observed during this visit, notwithstanding its brevity and the limited opportunity available to me for field work, especially in view of the several interesting records made there. A few of the more interesting 'finds' were recorded by the writer in 'The Auk,' Vol. XXIV, pp. 348, 349, July, 1907, and reference to a number of others is made in Mr. Otto Widmann's excellent work on the birds of Missouri, which has recently appeared.¹

Because of my short stay and the consequently restricted area

¹A Preliminary Catalog of the Birds of Missouri, by Otto Widmann. Trans. Acad. Sci. of St. Louis, Vol. XVII, No. 1, pp. 1-288. Issued Nov. 16, 1907.

covered, the list must necessarily be very incomplete, but in order to increase its value as a local list, I have added at the end as a supplementary list such species as have been noted in Shannon County by Mr. Walter Giles Savage, of Monteer, Missouri, but which were not seen there by me.

Shannon County is about fifty miles north of the Arkansas line and one hundred and ten miles west of the Mississippi River, and Carter County, which adjoins Shannon on the southeast, is thirty miles north of Arkansas and ninety miles west of the Mississippi (see Map); both counties lying on the southeastern slope of the Ozark Mountains of southern Missouri.

The Ozark region is hardly mountainous, as the name might imply, but is an isolated plateau with a maximum altitude of 1700 feet, lying between the Mississippi lowlands on the east and south-east, and the prairie region on the north and west.

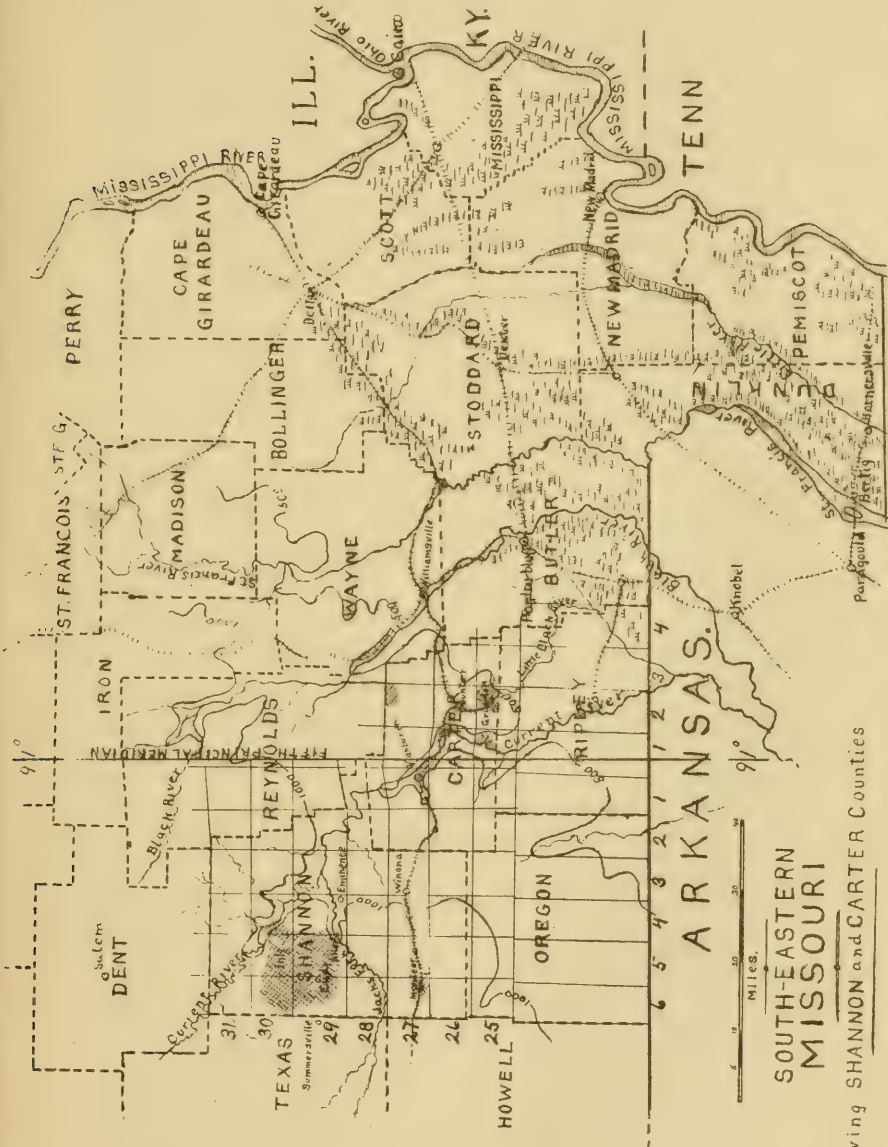
In Shannon County the surface of the plateau, here attaining a height of 1100 feet, has been deeply eroded through the action of streams. These have cut up the country into a maze of ravines, deep valleys and narrow gorges, with bluffs and cliffs of limestone often reaching a height of from 200 to 300 feet.

Two large streams, the Current River and Jack's Fork, cross this county and unite in the east-central part in Township 29, Range 3 West. The Current River enters the county in its north-western corner, flows in a general southeasterly direction, and passing into and through Carter County, finally empties into the Black River in Arkansas. Jack's Fork enters the county on the west and flows northeasterly till it meets and empties into the Current River.

In Carter County the hills, which here have an elevation of about 700 feet, are rolling and much less rugged than in Shannon County.

Originally both counties were covered with an unbroken forest of oaks and short-leaf pine (*Pinus echinata*), but the latter has now been almost wholly lumbered out except in certain portions of Shannon County.

As the work done in Shannon County was for the most part confined to Townships 29 and 30, Range 5 and 6 West (see Map), covering an area of about ninety square miles, a more detailed description of that section may be of interest. The country is extremely rough, with an intricate network of ravines, or "hollows,"



Showing SHANNON and CARTER Counties

as they are locally termed. The ravines and valleys contain water only after very heavy rains, a condition which occurred but twice during my stay, on March 13 and May 5. On these two occasions there had been a heavy down-pour during the preceding night, seemingly with little or no effect at first, but suddenly there was a roar of water and the previously dry bed of Spring Valley, by which we were encamped, was filled with a rushing torrent 4 to 10 feet deep and 30 to 100 feet wide. In about three days the water had disappeared except for occasional small pools. The explanation of this is to be found in the fact that the ground, which is largely of limestone formation, is honey-combed with caves and sinkholes, the latter sometimes a hundred feet deep. Springs appear only to disappear as suddenly a few feet below. The water is of a greenish blue color on account of the great amount of lime which it contains in solution.

At the time of my visit, this section of the county was still clothed with a virgin growth of pine and oak forest, of which the characteristic birds were Turkeys, Red-cockaded Woodpeckers, Bachman's Sparrows, and Pine Warblers. Unfortunately this forest is doomed, for a lumber company was even then building a railroad into the heart of the timber with a view to commencing lumbering operations at once. Forests of pure pine (*Pinus echinata*) and mixed pine and oak cover the tops of the ridges and the plateau, changing to pure stands of various species of oak on the steeper slopes. In the valley bottoms are found a greater variety of trees, including such species as walnut, sycamore, elm, silver maple, box elder, basswood, buckeye, redbud, and others, and small thickets of witchhazel, alder, sassafras and various species of small shrubs. Cardinals, Kentucky Warblers, and Green-crested Flycatchers were the conspicuous birds of these bottoms. The forest is remarkably free from all undergrowth, which is undoubtedly due to the long-continued custom of the settlers of burning over the ground each year, under the erroneous idea that they thereby improve the grazing. Clearings are few and far between and mostly in the narrow bottoms of Black, Casto, and Spring Valleys. The largest is at Eudy, a small settlement on the top of the plateau a mile and a half west of our camp, where an area about three-quarters of a mile square had been cleared and cultivated. Another small settlement, Ink, lay

five miles northeast of camp, and ten miles to the southeast was a smaller one, Alley, situated on the banks of Jack's Fork and on the road to Winona, some twenty-five miles to the southeast.

The settlers raise cattle and hogs, and enough corn to feed their stock during the winter. The latter roam the woods at will, for the only fences in this region are those enclosing the cornfields.

My stay in Shannon County lasted from March 10 to May 15, 1907, inclusive. The spring migration, so far as purely transient species were concerned, had scarcely gotten under way before my arrival, and most if not all the species observed the first few days had probably wintered in the region. The weather was very warm during the last three weeks of March, reaching an average maximum temperature of over 82° F. daily from March 17 to 29 inclusive, and causing the leaves and flowers of many trees and plants to burst their buds. The night of the 18th brought a large flight of birds, mostly of the sparrow family. It grew steadily colder from March 29th till April 19, often freezing at night after April 8, with the result that much of the newly grown foliage was killed. The days were raw, windy and rainy, and, except for two small flights on the nights of April 3 and 13, there was no noticeable movement of birds. On the 19th there came a welcome change in the weather and from then till April 29 it was warm and clear. With the change came the birds, of which there were large flights on April 20 and 21, 24 and 25, culminating on April 28 and 29 in the largest flight of the season. From then till May 8 it was rainy and colder and the migration halted. On May 8 and 9 and again on the 13th large flights occurred, and the transients were still present in large numbers when I left on May 15 for Grandin, Carter County.

April 19, 20 and 21 were spent at Current River near Round Spring (Twp. 30. R. 4 W), about twelve miles northeast of our camp. I found the valley fairly alive with birds and noted several species which did not appear in the region about camp till three or four days later. This valley is probably the main migration route for the county and is occupied by new migrants several days before the same species will be found in the surrounding region.

At Grandin, Carter County, the country differed somewhat in character from that about our camp in Shannon County. The valleys are broader and the hills much less rugged. Practically

all the pine has been cut and much of the oak also, so that considerable young second-growth woods is to be found. It is more thickly settled and consequently there is a greater proportion of cleared and cultivated land. In the river valleys are dense wooded thickets, containing a great variety of trees, bushes, and shrubs.

Grandin is a lumbering village situated in the valley of the Little Black River near the southern border of the county. I had stopped there for two days (March 7 to 9) on my way to camp, and returned May 16 to remain till June 8. The migration was still in full swing on May 16 and 17, but by the 20th it was practically over for the season. Many transients, however, remained till near the end of the month, for the extraordinarily late spring had greatly delayed the arrival and departure of all species.

Because of the late spring, most of the dates of arrival and departure given are probably several, and, in some cases, many days behind the normal dates of arrival and departure in that section. The migration during March was probably nearer normal, for the cold weather did not come on till April.

As Missouri lies on the dividing line between many of the eastern and western forms, it was not surprising that representatives of both forms of certain species and intermediates between them should have been found, and I am very much indebted to Dr. J. A. Allen, Dr. Jonathan Dwight, Jr., and to Mr. H. C. Oberholser for their valuable assistance in determining the subspecific rank of a number of the birds secured there. I am also much indebted to Mr. Walter Giles Savage of Monteer, Shannon Co., Mo., for supplying notes of the occurrence in Shannon County of such species of birds as have come under his observation during the past four years of his residence there, but which, owing to my brief visit and for other obvious reasons, seasonal and otherwise, were not observed by me.

Of the birds here listed, the following were the first to be recorded from Missouri: Red-cockaded Woodpecker,¹ White-winged Crossbill,² Western Savanna Sparrow³, Western Field Sparrow,⁴ Montana Junco,⁵ Brewster's Warbler,⁶ and Alder Flycatcher.⁷ Other records of especial interest were the finding of Bachman's Warbler⁸

¹ Auk, Vol. XXIV, p. 349.

² *Ibid.*

³ Widmann, Prelim. Cat. Birds Mo., p. 176.

⁴ *Ibid.*, p. 187.

⁵ *Ibid.*, p. 189.

⁶ Auk, Vol. XXIV, p. 348.

⁷ *Ibid.*, p. 349.

⁸ *Ibid.*, p. 348.

and Brown-headed Nuthatch,¹ and the occurrence of Bachman's Sparrow² and Pine Warbler³ as common summer residents in the pine woods of Shannon County.

A total of 189 species and subspecies are recorded in the following lists, including the supplementary list, of which 187 are to be credited to Shannon County; the only two not yet recorded from Shannon County being the Yellow-bellied Flycatcher (*Empidonax flaviventris*) and the Alder Flycatcher (*E. trailii alnorum*), which were secured at Grandin, Carter County. One hundred and three species were noted in Carter County during the three weeks of my stay there (March 7 and 8, and May 16 to June 8 inclusive).

Species whose occurrence was confirmed by the securing of specimens are designated by an asterisk (*) preceding their names. All records between the dates of March 10 and May 15, inclusive, apply to Shannon County only. Records on March 7 and 8 and from May 16 to June 8, inclusive, apply to Carter County only. Where no locality is given, it is to be understood that the bird in question was found in both counties. Such species as were found by me in one county only are so noted.

(*Anatidæ*.—On the evening of March 10, the night of my arrival in Shannon County, a steady stream of ducks was to be heard passing over us to the north till after midnight. This was the only night during which any were heard.)

*1. *Querquedula discors*. BLUE-WINGED TEAL.—Several were seen and one male secured on the Current River, April 18, 1907. Shannon Co.

2. *Marila affinis* (sp.?). LESSER SCAUP DUCK (?).—On April 20 two flocks of Scaup Ducks, about thirty in all and probably this species, were seen on the Current River, Shannon Co.

*3. *Botaurus lentiginosus*. AMERICAN BITTERN.⁴—On April 8, a very raw and windy day, I was surprised to see a bittern in the heart of the pine and oak woods and beside a shallow pool of rain water in a slight depression on the top of the plateau. His presence in such an unusual situation can probably be accounted for by the fact that the two preceding days and nights had been very windy with heavy showers. He appeared to be weak and unwilling to fly, merely flopping across the pool when I approached too near. On my return two or three hours later he had not moved. His stomach was empty. Shannon Co.

¹ Auk, Vol. XXIV, p. 349.

³ *Ibid.*, p. 348.

² *Ibid.*, p. 349.

⁴ Widmann, Prelim. Cat. Birds Mo., p. 52.

4. *Ardea herodias*. GREAT BLUE HERON.— On April 15 one was seen beside a pool in the otherwise dry river bed of Spring Valley, and another on April 20 flying over the Current River, Shannon Co.

5. *Butorides virescens*. GREEN HERON.— One was flushed from a tree over a pool of water filling one of the numerous sinkholes which are to be found all through the woods on top of the plateau. Shannon Co.

*6. *Nycticorax nycticorax naevius*. BLACK-CROWNED NIGHT HERON.— A specimen was secured in Spring Valley, April 23. The only one seen. Shannon Co.

*7. *Actodromas fuscicollis*. WHITE-RUMPED SANDPIPER.¹— One was secured from a flock of about twelve on a mudflat in Jack's Fork of Current River, May 15. Shannon Co.

*8. *Helodromas solitarius*. SOLITARY SANDPIPER.— One was seen May 1 beside a small pool of rain-water in the heart of the woods, and another secured May 13 beside a small pool in the meadows at Eudy. Single individuals were seen on the Current River April 20 and 21. Shannon Co.

9. *Actitis macularia*. SPOTTED SANDPIPER.— A single specimen was seen April 21 on Current River, Shannon Co.

*10. *Colinus virginianus*. BOBWHITE.— These birds were very common and were found not only in the valley bottoms in or near clearings, but also in the heart of the woods at some distance from any of the few and small clearings.

11. *Bonasa umbellus*. RUFFED GROUSE.— One was heard drumming on the bluffs above Current River, Shannon Co., April 19, 20 and 21, but with this exception none was seen or heard throughout my stay in Shannon or Carter Counties. This was not surprising, owing to the lack of suitable brush cover. The annual burning over of the floor of the forests is given by Mr. Widmann² as one of the theories to account for the disappearance of the Ruffed Grouse from the Ozarks, where they were formerly numerous. He says: "As this custom has been followed for fifty years, it has succeeded in extirpating a large number of plants, some of which may formerly have been helpful or needed in making the region a desirable abode for the Ruffed Grouse."

*12. *Meleagris gallopavo silvestris*. WILD TURKEY.— The Wild Turkey is still a comparatively common though extremely shy bird in Shannon County. On March 18 a flock of seven was seen, but as a rule they were single or in pairs. The cocks began "gobbling" the latter part of March, and as many as four gobblers were heard at the same time. On April 16 I secured a hen turkey in whose oviduct was found a fully developed egg, shell and all. In her crop was a small lizard. On May 13 one of our party flushed a turkey from a nest containing ten eggs, and on returning three or four days later the eggs were found to be cold and evidently deserted.

¹ Widmann, Prelim. Cat. Birds Mo., p. 68.

² *Ibid.*, p. 81.

*13. *Zenaidura carolinensis*. MOURNING DOVE.—Common about the cultivated fields at Eudy, Shannon Co. First seen March 17. Common at Grandin, Carter County.

14. *Cathartes aura septentrionalis*. TURKEY VULTURE.—Fairly common. Two eggs nearly ready to hatch were found May 13 in a small cave, four feet deep, in Shannon Co.

15. *Catharista urubu*. BLACK VULTURE.¹—Not common. Though I was confident that I saw this species a number of times, it was only once positively identified—April, 29, Shannon Co.

*16. *Accipiter velox*. SHARP-SHINNED HAWK.—Not common. Seen only four times (March 23, 30; April 21 and May 2). On May 2 I secured a female containing three nearly developed eggs in her ovaries, so they must breed here.² Shannon Co.

17. *Buteo borealis*. RED-TAILED HAWK.—Fairly common.

*18. *Buteo borealis krideri*. KRIDER'S HAWK.—On April 10 I secured an immature male which has since been identified by Mr. H. C. Oberholser as referable to this subspecies. Shannon Co.

19. *Buteo platypterus*. BROAD-WINGED HAWK.—Not common. A nest with three downy young a day or two old was found May 25 in an oak in the valley of the Little Black River near Grandin, Carter Co.

20. *Cerchneis sparveria*. AMERICAN SPARROW HAWK.—Fairly common.

21. *Pandion haliaëtus carolinensis*. AMERICAN OSPREY.—One seen over Current River, Shannon Co., April 21.

22. *Syrnium varium*. BARRED OWL.—A large owl, probably this species, was hooting about our camp in Shannon Co., on the night of April 21. (Mr. Savage informs me that he has heard this owl occasionally in this county.)

23. *Coccyzus americanus*. YELLOW-BILLED CUCKOO.—Fairly common. Two nests containing one egg each were found May 17 and 21 at Grandin.

24. *Coccyzus erythrophthalmus*. BLACK-BILLED CUCKOO.—Rare. None seen in Shannon Co. The only specimen positively identified was in Carter Co., May 23. (See supplementary list.)

25. *Ceryle alcyon*. KINGFISHER.—Fairly common.

*26. *Dryobates villosus*. HAIRY WOODPECKER.—Common in Shannon Co. None were seen at Grandin, Carter Co. The ovaries of a female secured March 27 contained two well developed ovules, so nesting had probably begun.

(One of the most noticeable things about the bird life in Shannon Co., was the great abundance of Woodpeckers of all kinds—eight species in all. This was especially marked during March before nesting had begun.)

*27. *Dryobates pubescens medianus*. DOWNY WOODPECKER.—Very common.

¹ Widmann, Prelim. Cat. Birds Mo., p. 88.

² *Ibid.*, p. 92.

*28. *Dryobates borealis*. RED-CKADED WOODPECKER.— I was fortunate enough to be the first to introduce this bird ¹ to the list of the birds of Missouri.² At first they seemed to be rare, for up to April 10 I had only found them twice — three together on March 15 and two on March 30. But from April 10 on till the end of my stay in Shannon Co. (May 15) I saw them constantly. The female of a pair secured April 19 (on which day I saw four pairs) was in breeding condition, and a male secured on May 12 showed by the thin and featherless condition of the skin on his breast and belly that he was sharing with his mate in the duties of incubation.

I met them again in the virgin pine woods near the northern border of Carter Co. (Twp. 27, R. 2 East) on May 29, but about Grandin, fourteen miles to the south, where all the pine had been cut, none were found. As they seemed to confine themselves to the pine woods, I believe they will be driven out of this region as fast as these woods are cut off.

*29. *Sphyrapicus varius*. YELLOW-BELLIED SAPSUCKER.— One was seen at Grandin March 8. They were abundant in Shannon Co. from March 21 to April 8, after which only a few were seen daily till April 25, and the last on May 9. This last record is considered suspiciously late by Mr. Widmann,³ and is possibly that of a breeding bird.

The sapsuckers were very partial to the sap (?) of witch-hazel, which grew abundantly in the bottoms of the larger ravines, and numbers of them were to be seen making rows of punctures on the stems of this shrub from six inches to two feet from the ground.

*30. *Phlœotomus pileatus abieticola*. NORTHERN PILEATED WOODPECKER.— The two specimens secured on April 13 and May 13, both males, were identified by Mr. H. C. Oberholser as belonging to this subspecies, though the southern form might be expected to occur there.

This woodpecker was fairly common in Shannon Co., but very shy and difficult to approach within gun range. The male secured May 13 proved by the condition of the skin on his breast and belly that he also was sharing with his mate in the duties of incubation.

None was seen at Grandin, but it doubtless occurs in the heavier woods.

*31. *Melanerpes erythrocephalus*. RED-HEADED WOODPECKER.— An abundant summer resident, and probably a rare winter resident. One specimen was seen March 10 and a pair March 30. These had probably wintered, for no more were seen in the region about our camp in Shannon Co. till April 26, on which date they were found in large numbers. But on April 20 I found them to be common in the valley of the Current River, some ten miles to the northeast of camp. These birds were probably the vanguard of the migrants which were pushing up the valley and which did not penetrate back into the forest until six days later. Common at Grandin.

¹ Auk, Vol. XXIV, p. 349.

² Widmann, Prelim. Cat. Birds Mo., p. 121.

³ *Ibid.*, p. 123.

*32. *Centurus carolinus*. RED-BELLIED WOODPECKER.— A fairly common resident.

*33. *Colaptes auratus luteus*. NORTHERN FLICKER.— Common. They were very abundant in Shannon Co. from March 19 to 24, when the main body of transients passed through.

34. *Caprimulgus carolinensis*. CHUCK-WILLS-WIDOW.— None were positively identified in Shannon Co., though on May 12 I flushed a bird which from its large size I suspected to be this species. (See supplementary list.) At Grandin, Carter Co., they were evidently fairly common, for on the nights of May 21, 22 and 23 several could be heard at the same time. It was easy to distinguish them from the Whip-poor-will, for both species could be heard at one time; the one in the valley bottom and the other in the slopes above.

*35. *Caprimulgus vociferus*. WHIP-POOR-WILL.— Common. The first specimen was seen and secured April 6.

36. *Chordeiles virginianus*. NIGHTHAWK.— Not very common. First one seen May 8.

37. *Chaetura pelagica*. CHIMNEY SWIFT.— Because of the extensive woods and of the fact that chimneys were few and far between in the vicinity of our camp in Shannon Co., swifts were rarely seen. The first one noticed was on May 10.

In Carter Co. they were common.

*38. *Trochilus colubris*. RUBY-THROATED HUMMINGBIRD.— The first hummingbird appeared April 28, and they became common on and after May 4.

39. *Tyrannus tyrannus*. KINGBIRD.— Lack of suitable country doubtless accounts for the rarity of the Kingbird in this section of Shannon Co. They were met with only twice — April 28 and May 4 — and on both occasions were in the meadows at Eudy.

At Grandin they were fairly common.

40. *Myiarchus crinitus*. CRESTED FLYCATCHER.— Common. Arrived in Shannon Co. April 29.

41. *Sayornis phoebe*. PHOEBE.— Common. The Phoebe was already present on my arrival at Grandin on March 8, and in Shannon Co., March 10. On March 16 I saw a Phoebe building a nearly completed nest under an overhanging limestone cliff. Several nests were found in like situations in the latter part of March.

42. *Myiochanes virens*. WOOD PEWEE. Common, arriving in Shannon Co., April 29.

*43. *Empidonax flaviventris*. YELLOW-BELLIED FLYCATCHER.¹— The only specimen seen was one which I secured at Grandin, Carter Co., May 16.

*44. *Empidonax virescens*. GREEN-CRESTED FLYCATCHER.— Common. First seen in Shannon Co. April 29 and became common after May 8.

*45. *Empidonax trailli alnorum*. ALDER FLYCATCHER.^{2, 3} — On June

¹ Widmann, Prelim. Cat. Birds Mo., p. 140.

² Auk, Vol. XXIV, p. 349.

³ Widmann, Prelim. Cat. Birds Mo., p. 142.

3, I saw a pair of these birds on the edge of a small apple orchard in a meadow in the valley of the Little Black River at Grandin, Carter Co. The female was secured (No. 1583, ♀, Coll. of L. B. and E. S. W.) and was identified as belonging to this subspecies by Dr. J. A. Allen, Dr. J. Dwight, Jr., and Mr. H. C. Oberholser. This is the first Alder Flycatcher to be recorded from Missouri.

(In recording this bird in 'The Auk,' Vol. XXIV, p. 349, I inadvertently used the name 'Traills' Flycatcher, though designating it under its proper subspecific name.)

*46. *Empidonax minimus*. LEAST FLYCATCHER.—Not common. First seen May 8, and last seen May 17. Shannon Co.

*47. *Otocoris alpestris praticola*. PRAIRIE HORNED LARK.—Several pairs were breeding in the meadows about Eudy, Shannon Co. The condition of the breast and belly of a female secured March 23 proved that breeding had already begun at that time.

*48. *Cyanocitta cristata*. BLUE JAY.—Common. They were abundant in Shannon Co. from April 28 to May 4 inclusive, flying about in large flocks.

49. *Corvus brachyrhynchos*. AMERICAN CROW.—Not common.

50. *Dolichonyx oryzivorus*. BOBOLINK.—Rare, but this was to be expected considering the scarcity of open fields. Two were seen May 4 in the meadows at Eudy, Shannon Co., and several at Grandin, Carter Co., May 16 and 21.

*51. *Molothrus ater*. COWBIRD.—Common. First seen in Shannon Co., March 19. In Carter Co. I found a nest of the Bachman Sparrow on May 27, which contained, besides two of its own eggs, three of the Cowbird, all evidently laid by the same bird.

52. *Agelaius phoeniceus*. RED-WINGED BLACKBIRD.—I saw this bird in the valley of Jack's Fork on my way to and from camp, March 10 and May 15, and they were probably common in the valleys of this and the Current River.

At Grandin they were common in wet meadows.

*53. *Sturnella magna*. MEADOWLARK.—Fairly common in clearings.

*54. *Icterus spurius*. ORCHARD ORIOLE.—Common about clearings. First seen May 9.

55. *Icterus galbula*. BALTIMORE ORIOLE.—Rare. Only one specimen seen in Shannon Co., May 4. None seen at Grandin.

56. *Euphagus carolinus*. RUSTY BLACKBIRD.—A large flock was seen March 19. Shannon County.

57. *Quiscalus quiscula æneus*. BRONZED GRACKLE.—Fairly common near clearings in Shannon Co. None seen at Grandin.

*58. *Carpodacus purpureus*. PURPLE FINCH.—The Purple Finch was already present on my arrival at Grandin March 8, and in Shannon Co. March 10, and were to be seen in large flocks till April 25, on which day the last bird was noted.

*59. *Loxia curvirostra minor*. AMERICAN CROSSBILL.¹—Small flocks

¹ Widmann, Prelim. Cat. Birds Mo., p. 168.

were seen in Shannon Co. every few days from April 3 to May 1 inclusive.

*60. *Loxia leucoptera*. WHITE-WINGED CROSSBILL.¹ — On April 18 I secured a female White-winged Crossbill that was feeding on the ground in company with two American Crossbills, both females. This is the first one to be recorded from Missouri, and, as a record, is all the more surprising because of having been taken so near the southern border, while it has not yet been recorded from the northern part of the State.

61. *Astragalinus tristis*. AMERICAN GOLDFINCH.—Goldfinches were fairly common, though varying exceedingly in numbers, throughout my stay in the Ozarks.

*62. *Spinus pinus*. PINE SISKIN.³ — The first siskins were seen in Shannon Co. on April 28, 29 and 30. Another flock was seen May 13. At Grandin, Carter Co., I found small flocks on May 16, 17 and 21, and on June 4, when in the pine woods near the northern border of the county, a siskin flew by me so close that I could not have been mistaken in my identification.

63. *Passer domesticus*. ENGLISH SPARROW.—Even in the heart of the pine and oak woods, wherever there was a clearing with an occupied log cabin, this omnipresent bird was to be found.

*64. *Poocetes gramineus*. VESPER SPARROW.⁴ — A common transient in meadows in the valley bottoms and about Eudy, Shannon Co. The first were seen March 19 and last on April 7.

*65. *Passerculus sandwichensis savanna*. SAVANNA SPARROW.⁵ — Two were found April 25, and on April 28, May 4 and May 13, I found them common on the meadows about Eudy, Shannon Co. A Savanna Sparrow taken March 22 (the date given by Mr. Widmann,⁵ March 19, is an error), proved to belong to the following subspecies.

*66. *Passerculus sandwichensis alaudinus*. WESTERN SAVANNA SPARROW.⁶ — On March 22 I found a flock of sparrows in a narrow meadow in Spring Valley containing three or four Savanna Sparrows and a number of Vesper Sparrows. One of the former was secured and was identified by Mr. H. C. Oberholser as belonging to this subspecies (No. 1400, ♂, Coll. of L. B. and E. S. W.).

This specimen is the first recorded from Missouri.

*67. *Coturniculus savannarum passerinus*. GRASSHOPPER SPARROW.⁷ — Several were seen and one secured in a narrow meadow in Black Valley, Shannon Co., on March 19. This appears to be the earliest date on record for Missouri. Mr. Widmann states⁸ that the first arrive in southern

¹ Widmann, Prelim. Cat. Birds Mo., p. 169.

² Auk, Vol. XXIV, p. 349.

³ Widmann, Prelim. Cat. Birds Mo., p. 171.

⁴ *Ibid.*, p. 175.

⁵ *Ibid.*, p. 176.

⁶ *Ibid.*, p. 176.

⁷ *Ibid.*, p. 177.

⁸ *Ibid.*, p. 177.

Missouri about the middle of April. The day and night preceding (March 18) had been exceptionally warm, and on the morning of the 19th I found the woods and valleys full of birds. The Fringillidæ were most in evidence and among them several new arrivals (Grasshopper, Henslow, Vesper, Bachman's, and Swamp Sparrows). No more Grasshopper Sparrows were seen till April 14 and 17, on each of which days I saw and secured one specimen. On the 25th of April I found them common in the meadows at Eudy, and they were still to be found there May 13. I also found them at Grandin, Carter Co. (June 3), and believe they breed there.

After comparing the four specimens secured in Missouri with others secured in Connecticut I came to the conclusion that they were "rather intermediates, but nearer *bimaculatus*," and they were thus recorded by Mr. Widmann,¹ but Mr. H. C. Oberholser has since examined and identified these specimens as the eastern form (*C. s. passerinus*).

*68. **Ammodramus henslowi.** HENSLow SPARROW.—One was secured March 19 (the earliest date on record for Missouri)² from a flock of several Grasshopper, Vesper and Field Sparrows on the edge of a corn field in Black Valley, Shannon Co. Another was seen May 4 in the Eudy meadows.

*69. **Chondestes grammacus.** LARK SPARROW.—Evidently an uncommon bird in this region. One was seen and secured in a freshly plowed field at Eudy, Shannon Co., on May 13, and I found it again at Grandin, Carter Co., on May 16 and 17, one each day.

*70. **Zonotrichia leucophrys.** WHITE-CROWNED SPARROW.—Only met with twice, May 11 and 13; Shannon Co.

*71. **Zonotrichia albicollis.** WHITE-THROATED SPARROW.—Present on my arrival in Shannon Co., March 10, and common throughout my stay there. At Grandin, Carter Co., the last were seen May 17.

*72. **Spizella socialis.** CHIPPING SPARROW.—Common. First seen March 12, became common March 19, and abundant from April 9 to 20 when they were to be found everywhere—in the depths of the pine woods on top of the plateau, and in the open stretches in the valley bottoms.

*73. **Spizella pusilla.** FIELD SPARROW.—Already present on my arrival in Shannon Co., March 10, on which date I saw one. They became common on March 19. A nest and four eggs were found May 21 at Grandin, Carter Co.

*74. **Spizella pusilla arenacea.** WESTERN FIELD SPARROW.—Two of the four specimens of Field Sparrows taken in Shannon Co. proved to be of this form. These two specimens were secured March 13 and 19 (No. 1372 and 1392, Coll. of L. B. and E. S. W.), and are the first to be recorded from Missouri.³ Mr. H. C. Oberholser has confirmed my identification.

¹ Widmann, Prelim. Cat. Birds Mo., p. 178.

² *Ibid.*, p. 178.

³ *Ibid.*, p. 187.

On March 19, several *S. p. arenacea* were seen in a flock of *S. p. pusilla*, and I found it easy to distinguish them by the conspicuous gray crown-stripe of the former.

*75. **Junco hyemalis.** SLATE-COLORED JUNCO.—Juncos were present in large numbers on my arrival in Carter Co., March 7, and in Shannon Co. March 10. They were less abundant after April 7, and the last were seen April 27, except for a lone male secured May 21 at Grandin, Carter Co.¹ On examining this latter bird I found that its belly was distended to twice its normal size and was packed solid with a mass of transparent worms, three inches or more long and as thick as a small match, filling up every bit of space in the intestinal cavity. Though able to fly and otherwise in good condition, this load was evidently too much to carry and was the probable explanation of this exceptionally late date.

Dr. Jonathan Dwight, Jr., who is making an exhaustive study of the various races of Juncos of North America, kindly examined the series of thirteen Juncos secured, and divided them into the three races: *hyemalis hyemalis*, *hyemalis connectens*, and *hyemalis montanus*.

Specimens of *J. h. hyemalis*, taken from one flock March 11 in Shannon County, were very dark birds and typical of *J. h. hyemalis* from Alaska. Others taken later in the month and in April were similar to eastern representatives of the race.

*76. **Junco hyemalis connectens.** SCHUFELDT'S JUNCO.—A male Junco collected at Hunter, Carter Co., March 7, and a female collected in Shannon Co. March 17, were assigned by Dr. Dwight to this form.

*77. **Junco montanus.** MONTANA JUNCO.²—A female (No. 1364, ♀, Coll. L. B. and E. S. W.), secured March 11 from a large flock of Juncos in Shannon Co. was identified by both Dr. Dwight and Mr. H. C. Oberholser as of this species.

This is the first Montana Junco to be recorded from Missouri.

*78. **Peucæa æstivalis bachmanii.** BACHMAN'S SPARROW.^{3, 4}—On March 19 I saw and secured the first Bachman's Sparrow, and on and after April 6 found it common throughout the mixed pine and oak woods of Shannon Co. They seemed to prefer stands of mixed pine and oak to either pure pine or pure oak.

In Carter Co. I found it only four times (May 17, 24, 27 and June 4), but the fact that almost all the pine had been cut may explain their rarity here. On May 27, in the virgin pine and oak forest near the northern border of the county (Twp. 27, R. 2 East), I flushed a Bachman's Sparrow from a nest containing two of her own eggs and three of the Cowbird—incubation far advanced.^{5, 6} This find was the first conclusive proof of

¹ Widmann, Prelim. Cat. Birds Mo., p. 188.

² *Ibid.*, p. 189.

³ *Ibid.*, p. 189.

⁴ Auk, Vol. XXIV, p. 349.

⁵ Widmann, Prelim. Cat. Birds Mo., p. 189.

⁶ Auk, Vol. XXIV, p. 349.

its breeding in the State. The nest was on the ground in a small clump of long grass and New Jersey tea (*Ceanothus americanus*), and close to the fallen top of a recently cut pine. These birds were found almost invariably near or in the tops of dead and down trees.

*79. *Melospiza cinerea melodia*. SONG SPARROW.—The Song Sparrow was a rare bird in Shannon Co., and not seen at all in Carter Co. I noted it only six times (March 10, 13, 17, 19, 30, and April 14). On March 19, the day sparrows of all kinds were so abundant, it was fairly common, but on the other dates only from one to three or four were noted.

*80. *Melospiza lincolni*. LINCOLN'S SPARROW.—These birds were probably fairly common though not many were seen. They confined themselves to the dense patches of low shrubs in the valley bottoms where it was difficult to see them and from which it was almost impossible to flush them. I met with it first April 14 in Shannon Co., and the last one was seen May 20 in Carter Co.

*81. *Melospiza georgiana*. SWAMP SPARROW.¹—Not common. First seen March 19; last seen May 13; Shannon Co.

*82. *Passerella iliaca*. FOX SPARROW.—Fox Sparrows were very abundant at Hunter, Carter Co., March 7. The oak woods by the railroad station was alive with them. In Shannon Co. they were common until March 24 when they left except for one lone specimen seen April 6.

*83. *Pipilo erythrophthalmus*. TOWHEE.—Already present on my arrival at Grandin March 8, and Shannon Co. March 10, and was fairly common throughout my stay.

*84. *Cardinalis cardinalis*. CARDINAL.—Very common. Nests with eggs found from April 29 to May 25 inclusive, and a nearly full grown young bird was seen May 5.

*85. *Zamelodia ludoviciana*. ROSE-BREADED GROSEBEAK.—Rare. A male was seen May 2 and a female May 8, Shannon Co. At Grandin, I saw on May 20 what I was confident was a female Rose-breast high up in a tree, but as they rarely breed so far south, this record cannot be accepted as positive.

*86. *Passerina cyanea*. INDIGO BUNTING.—First seen April 28 and became common May 8, remaining so throughout my stay.

*87. *Spiza americana*. DICKCISSEL.—None were seen in the vicinity of our camp, but several were found May 15 in a cultivated meadow near Winona, Shannon Co. At Grandin they were common in meadows in the valley of the Little Black River. A nest with 5 fresh eggs was found June 3.

*88. *Piranga erythromelas*. SCARLET TANAGER.—Arrived in large numbers April 25 and was fairly common thereafter.

*89. *Piranga rubra*. SUMMER TANAGER.—First seen April 26 and became common on April 29. A nest with four eggs was found in Carter Co. June 4.

¹ Widmann, Prelim. Cat. Birds Mo., 192.

*90. *Progne subis*. PURPLE MARTIN.—First seen March 18. There was a small colony at Eudy, Shannon Co. At Grandin they were common, breeding in bird houses erected for their use.

91. *Hirundo erythrogaster*. BARN SWALLOW.—A flock of 12 Barn Swallows flew over me in Shannon Co., May 7, and several were seen flying over Jack's Fork May 15. None was seen in Carter Co.

92. *Iridoprocne bicolor*. TREE SWALLOW.—Rare. On May 4 I saw a lone Tree Swallow flying about a small pool of water in the meadows at Eudy, Shannon Co., and on May 15 several over Jack's Fork.

*93. *Stelgidopteryx serripennis*. ROUGH-WINGED SWALLOW.—Rough-winged Swallows were common along the Current River, in Shannon Co., April 20 and 21, over Jack's Fork May 15 and along the Current River in Carter Co. May 17.

94. *Bombycilla cedrorum*. CEDAR WAXWING.—None was seen in Shannon Co. At Grandin small flocks were seen May 20 and 24.

*95. *Lanius ludovicianus migrans*. MIGRANT SHRIKE.—The only Migrant Shrikes met with were two specimens that I secured March 18 in clearings in Black Valley, Shannon Co.

96. *Vireosylva olivaceus*. RED-EYED VIREO.—Common. First seen April 29.

*97. *Vireosylva philadelphicus*. PHILADELPHIA VIREO.¹—The first and only Philadelphia Vireo seen in Shannon Co., was one secured May 9.

At Grandin, Carter Co., I took two on May 17 and saw two more May 24, securing one.

*98. *Lanivireo flavifrons*. YELLOW-THROATED VIREO.—First one was seen April 14. They were common from April 25 to 30 inclusive, but from then until I left Shannon Co. (May 15) it was only occasionally met with. None seen in Carter Co.

99. *Lanivireo solitarius*. BLUE-HEADED VIREO.—Only one specimen was seen May 9; Shannon Co.

*100. *Vireo noveboracensis*. WHITE-EYED VIREO.—Arrived April 28 in Shannon Co., and were common thereafter. A nest with 4 fresh eggs and one of a Cowbird was found May 25 at Grandin, Carter Co.

101. *Mniotilta varia*. BLACK AND WHITE WARBLER.—This was the first of the warblers to appear in Shannon Co., arriving March 23.

It was fairly common throughout my stay in both counties.

*102. *Helminthus vermivorus*. WORM-EATING WARBLER.²—A common bird in Shannon Co., arriving April 25. At Grandin, only one was seen—May 30.

*103. *Helminthophila bachmani*. BACHMAN'S WARBLER.^{3, 4}—I was fortunate enough to meet with this interesting bird on two different occa-

¹ Widmann, Prelim. Cat. Birds Mo., p. 209.

² *Ibid.*, p. 215.

³ *Ibid.*, p. 215.

⁴ Auk, Vol. XXIV, p. 348.

sions, securing a male in Shannon Co. May 2, and another male at Grandin, Carter Co., May 23 (Nos. 1499 and 1575, Coll. L. B. and E. S. W.) There can be but little question that both these birds were on their breeding grounds, for the Bachman's Warbler is one of our earliest warbler migrants, arriving in southern United States in March and is on its breeding grounds in Dunklin Co., Mo., by the middle of April. Nests with eggs were found by Mr. O. Widmann in Dunklin Co. as early as May 14 (1898). This extends the range of Bachman's Warbler about 100 miles to the northwest. The most surprising thing, especially in the case of the Shannon Co. bird, was that they should have been found in a locality so totally different in character from that of their previously known breeding haunts. The Shannon Co. bird was in some low bushes in the dry stream bed of Spring Valley (Twp. 29, R. 5, Section 5). The Grandin bird was in a dense, wooded thicket in the valley of the Little Black River—a more suitable situation, though still in a hilly and comparatively dry country. The latter bird was like a will-o'-the-wisp, leading me on, singing just ahead of me and keeping out of sight except for an occasional fleeting glimpse. Then he would stop singing for ten or fifteen minutes at a time, only to begin again back where I had first heard him. Once he suddenly appeared in the lower branches of a small tree within fifteen feet of me, and seemed utterly unmindful of my presence though I was in full view, foraging busily and silently among the leaves near the ends of the branches. Though he spent most of his time feeding and singing in shrubs and bushes, he would occasionally mount well up into the branches of some of the taller trees and sit quietly singing. After I had spent over two hours there patiently watching and waiting, I shot him while he was pouring out his song about 35 feet up in an oak. The song to my ear is very similar to that of the Worm-eating Warbler. I felt confident that I heard another male singing at the same time, but as none were seen or heard on several later visits to the same locality, I may have been mistaken.

*104. *Helminthophila pinus*. BLUE-WINGED WARBLER.—Common. The first one was seen at the Current River, Shannon Co., April 20, and they appeared in the vicinity of our camp April 24.

*105. *Helminthophila leucobronchialis*. BREWSTER'S WARBLER.^{1, 2}—On May 12 I secured in Shannon Co. an absolutely typical specimen of the Brewster's Warbler (No. 1531, ♂, Coll. L. B. and E. S. W.). The entire underparts are pure white without even a suggestion of any yellow wash. The back is bluish gray slightly tinged in the middle with greenish. A single, broad wing-patch of canary yellow. Its song was similar to that of *H. chrysoptera*. This is the first Brewster's Warbler to be recorded from Missouri or from west of the Mississippi River.

*106. *Helminthophila rubricapilla*. NASHVILLE WARBLER.—Arrived in Shannon Co. April 28 and were fairly common. The last were seen May 17 at Grandin, Carter Co.

¹ Auk, Vol. XXIV, p. 348.

² Widmann, Prelim. Cat. Birds Mo., p. 216.

*107. *Helminthophila peregrina*. TENNESSEE WARBLER.— Arrived April 25, became common April 29, and from May 9 till I left Shannon Co. (May 15) they were by far the most abundant of all the warbler family. I found them abundant at Grandin, Carter Co., May 16 and 17 and the last was seen May 25. On May 2 I secured a male Tennessee Warbler in Shannon Co., which had a number of coppery-chestnut feathers in its crown, similar to those of a Nashville Warbler. In all other respects it was a typical Tennessee Warbler (No. 1500, ♂, Coll. L. B. and E. S. W.).¹

*108. *Compsothlypis americana ramalinæ*. WESTERN PARULA WARBLER.— First seen April 20, when I found it abundant in the valley of the Current River, Shannon Co. In the vicinity of our camp, I saw it only 3 times; one on April 23, several April 24, and one April 26. At Grandin, it was a rather rare summer resident. The three specimens secured April 20, May 17 and May 30 were identified by Mr. H. C. Oberholser as belonging to this form.

*109. *Dendroica tigrina*. CAPE MAY WARBLER.² — A single individual was seen and secured May 10 and another May 15, both of them near Alley, Shannon Co.

110. *Dendroica æstiva*. YELLOW WARBLER.— First seen April 25, and became fairly common on and after May 3.

*111. *Dendroica coronata*. MYRTLE WARBLER.— Single individuals were seen at Grandin, Carter Co., March 8, and in Shannon Co., March 21 and April 4. The first two and possibly all three may have been winter residents, for the transients did not appear till April 13. They were common until May 4 in Shannon Co., and the last were seen May 17 at Grandin.

112. *Dendroica maculosa*. MAGNOLIA WARBLER.— In Shannon Co. the Magnolia Warbler appeared to be a rare migrant, for I met with it only twice — May 9 and 15. Mr. W. G. Savage reports it as fairly common at Monteer. At Grandin, Carter Co., I found it May 16 and 17.

*113. *Dendroica cerulea*. CERULEAN WARBLER.— Arrived April 27 and was fairly common in Shannon Co. In Carter Co. I found it in small numbers in the river valleys.

114. *Dendroica pensylvanica*. CHESTNUT-SIDED WARBLER.— Not common. Single individuals were seen in Shannon Co., May 9, 10, 11 and several May 13. At Grandin several were seen May 16 and 17.

*115. *Dendroica castanea*. BAY-BREASTED WARBLER.³ — None were seen in Shannon Co. (See supplementary list.) At Grandin I found it May 16, 17 and 21, one each day.

*116. *Dendroica striata*. BLACK-POLL WARBLER.— A common transient. Arrived, Shannon Co., May 9. The last were seen at Grandin May 23.

¹ Auk, Vol. XXIV, p. 348

² Widmann, Prelim. Cat. Birds Mo., p. 221.

³ *Ibid.*, p. 227.

117. *Dendroica blackburniæ*. BLACKBURNIAN WARBLER.¹—A rare migrant. One was seen in Shannon Co. May 13, and at Grandin one May 16, and several May 17.

*118. *Dendroica dominica albilora*. SYCAMORE WARBLER.²—Not common in Shannon Co. Arrived March 28. They were fairly common in Carter Co. These birds were invariably found high up in pines on top of the ridges. None were seen or heard in the valleys, even where there were plenty of sycamores.

119. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.—Not common. Single birds were seen in Shannon Co. on May 1, 4 and 10 and several on May 12 and 13. At Grandin one was seen May 17.

*120. *Dendroica vigorsii*. PINE WARBLER.^{3, 4}—The Pine Warbler was already present on my arrival at Grandin March 8, and in Shannon Co. March 10. It was common throughout my stay in Shannon Co. in the pine woods. I found no nests, but saw the birds gathering nesting material and carrying it up into the pines several times in the latter part of March, and on April 25 a nestling was secured, too young to fly, which had fallen from its nest and was being fed on the ground by its parents. I also found a number of full-grown young birds in nestling plumage before the middle of May, so there can be no question that it is a common summer resident in this region.

*121. *Dendroica discolor*. PRAIRIE WARBLER.—Arrived April 24 in Shannon Co., and became common on and after April 26. Common at Grandin.

122. *Seiurus aurocapillus*. OVENBIRD.—Arrived April 19 and became abundant April 26. Common in both Shannon and Carter Cos.

*123. *Seiurus noveboracensis notabilis*. GRINNELL'S WATERTHRUSH.⁵—A common transient. The first were seen in Shannon Co. May 9, and the last (one) at Grandin May 24. The three specimens secured May 9, 12 and 21, were identified by Mr. H. C. Oberholser as belonging to this subspecies.

*124. *Seiurus motacilla*. LOUISIANA WATERTHRUSH.—First seen March 21.⁶ I found it common in the Current River valley April 19 and 20. None were seen after May 2, though they would probably have been found along the Current River had I revisited it. At Grandin I saw none at all.

*125. *Oporornis formosa*. KENTUCKY WARBLER.—Arrived April 28 and was common thereafter.

*126. *Oporornis philadelphia*. MOURNING WARBLER.⁷—A specimen secured May 13 at Eudy, Shannon Co., was the only one seen.

¹ Widmann, Prelim. Cat. Birds Mo., p. 229.

² *Ibid.*, p. 230.

³ *Ibid.*, p. 231.

⁴ Auk, Vol. XXIV, p. 348.

⁵ Widmann, Prelim. Cat. Birds Mo., p. 234.

⁶ *Ibid.*, p. 235.

⁷ *Ibid.*, p. 237.

*127. *Geothlypis trichas brachidactyla*. NORTHERN YELLOW-THROAT. — Arrived April 29. Was rather rare in Shannon Co., but common at Grandin.

*128. *Icteria virens*. YELLOW-BREASTED CHAT. — Arrived April 27 and became very common on and after May 3.

*129. *Wilsonia mitrata*. HOODED WARBLER. — Rare. Only met with twice in Shannon Co. — April 29 and May 15 (Jack's Fork). None were seen at Grandin.

*130. *Wilsonia pusilla*. WILSON'S WARBLER. — A specimen secured May 9 was the only one seen in Shannon Co.

At Grandin they were fairly common from May 16 to 20 inclusive.

131. *Wilsonia canadensis*. CANADIAN WARBLER. — None were seen in Shannon Co., possibly because I left (May 15) before they arrived there (see supplementary list). At Grandin I found them common from May 16 to 20 inclusive.

132. *Setophaga ruticilla*. AMERICAN REDSTART. — None were seen in Shannon Co. till May 12, and thereafter but two or three each day until my departure, May 15. At Grandin they were common on May 16 and 17, but none were seen thereafter, so it would appear that they do not breed in this region.

*133. *Mimus polyglottos*. MOCKINGBIRD. — The wilds of the Ozarks had evidently no attraction for this bird, for I saw none till I reached Winona, Shannon Co., where I found them common May 15 and 16. At Grandin only one Mockingbird was seen — May 17.

134. *Dumetella carolinensis*. CATBIRD. — Rare. In Shannon Co. one was seen April 30 and another May 4. At Grandin several were noted May 17.

135. *Toxostoma rufum*. BROWN THRASHER. — First one was seen March 31. They were not common, and were seen very irregularly in Shannon Co. At Grandin it was fairly common.

*136. *Thryothorus ludovicianus*. CAROLINA WREN. — Resident, but not very common in Shannon Co., confining themselves to the larger valleys. They were fairly common at Grandin.

*137. *Thryomanes bewickii*. BEWICK'S WREN. — First one was seen in Shannon Co., March 17. They were common from March 23 to March 30 inclusive all through the forest, but after that were rarely seen and then about houses only. At Grandin they were common.

138. *Troglodytes ædon aztecus*. WESTERN HOUSE WREN. — Rare. One was seen in Shannon Co. April 25 and another April 28. Unfortunately neither specimen was secured, but as Missouri lies within the range of the western form, I have assigned the above birds to this subspecies.

*139. *Nannus hiemalis*. WINTER WREN. — Rare. Two were seen March 23, one April 3,¹ two April 10, and one April 21, all in Shannon Co.

*140. *Cistothorus stellaris*. SHORT-BILLED MARSH WREN.² — On May

¹ Widmann, Prelim. Cat. Birds Mo., p. 250.

² *Ibid.*, p. 251.

14 I secured a female Short-billed Marsh Wren in some witch-hazel bushes in the dry creek-bed of Spring Valley, Shannon Co. Considering the fact that this was in a dry, heavily-wooded and mountainous region with no marshes within many miles, this record is very surprising.

*141. *Telmatodytes palustris iliacus*. PRAIRIE MARSH WREN.¹ — On May 9, in Shannon Co., I saw three Prairie Marsh Wrens in as many different places and several miles apart, securing two of them. Finding these birds here was as surprising as in the case of the Short-billed Marsh Wren, and for the same reason.

142. *Certhia familiaris americana*. BROWN CREEPER. — Probably a winter resident in Shannon Co. I found it March 11 and it was fairly common till April 24 when the last were seen.

143. *Sitta carolinensis*. WHITE-BREASTED NUTHATCH. — A common resident.

*144. *Sitta canadensis*. RED-BREASTED NUTHATCH.² — Probably a winter resident in the pine region of Shannon Co., but not common. I found it March 11, 14, 24, 30; April 6, 17, 27; May 1, 9 and 12. Shannon Co.

*145. *Sitta pusilla*. BROWN-HEADED NUTHATCH.^{3,4} — On March 19 I secured a pair of Brown-headed Nuthatches in some pines on the edge of a clearing in Black Valley, Shannon Co. The female was flying back and forth to an old, dead pine in a cornfield and seemed much disturbed after I had shot her mate. The only other record for this bird in Missouri is a bird seen by Mr. O. Widmann in St. Louis, May 6, 1878 and reported in Nut. Bull., Vol. V, p. 191.

*146. *Bæolophus bicolor*. TUFTED TITMOUSE. — A common resident.

*147. *Penthestes carolinensis*. CAROLINA CHICKADEE. — A common resident.

*148. *Regulus satrapa*. GOLDEN-CROWNED KINGLET. — Common until April 23, when the last were seen. Found at Grandin March 8.

*149. *Regulus calendula*. RUBY-CROWNED KINGLET. — A common transient in Shannon Co. First seen March 19,⁵ and last seen May 4.

*150. *Polioptila cærulea*. BLUE-GRAY GNATCATCHER. — Common in Shannon Co., arriving April 12. They were abundant throughout the forest from May 4 to 7 inclusive.

Fairly common at Grandin.

151. *Hylocichla mustelina*. WOOD THRUSH. — Common. Arrived in Shannon Co. April 25.

*152. *Hylocichla aliciae*. GRAY-CHEEKED THRUSH. — Common in Shannon Co. April 28 to May 13 inclusive.

¹ Widmann, Prelim. Cat. Birds Mo., p. 252.

² *Ibid.*, p. 254.

³ Auk, Vol. XXIV, p. 349.

⁴ Widmann, Prelim. Cat. Birds Mo., p. 255.

⁵ *Ibid.*, p. 258.

*153. *Hylocichla ustulata swainsonii*. OLIVE-BACKED THRUSH.— A common transient. Arrived April 29 in Shannon Co., and was fairly common till May 25¹ on which date the last were seen at Grandin.

*154. *Hylocichla guttata pallasii*. HERMIT THRUSH.² — Not common. First one was seen March 26, and last, April 27. Shannon Co.

155. *Planesticus migratorius*. AMERICAN ROBIN.— Already present on my arrival in Carter Co. March 7, and in Shannon Co. March 10. The Robin was common as a transient in March, but rare as a summer resident in both Shannon and Carter Cos. I found a nest with 4 eggs in an apple orchard at Eudy, Shannon Co., May 13.

156. *Sialia sialis*. BLUEBIRD.— Already present on my arrival in Carter Co. March 7, and Shannon Co. March 10, and was fairly common about clearings.

Supplementary List.

The following are the additional records for Shannon County kindly furnished me by Mr. W. G. Savage. Those in brackets are species which are noted in the foregoing list as found by me in Carter County, but not in Shannon.

157. *Podilymbus podiceps*. PIED-BILLED GREBE.— Rather rare.

158. *Larus argentatus*. HERRING GULL.— Rare. Observed twice in four years.

159. *Pelecanus erythrorhynchos*. AMERICAN WHITE PELICAN.— Rare.

160. *Anas boschas*. MALLARD.— Fairly common.

161. *Nettion carolinensis*. GREEN-WINGED TEAL.— Fairly common.

162. *Dafila acuta*. PINTAIL.— Fairly common.

163. *Marila collaris*. RING-NECKED DUCK.— Rare.

164. *Porzana carolina*. SORA.— Rare.

165. *Fulica americana*. AMERICAN COOT.— Rather rare.

166. *Gallinago delicata*. WILSON'S SNIPE.— Rare. Only seen once.

167. *Totanus melanoleucus*. GREATER YELLOW-LEGS.— Rare. Only seen twice.

168. *Bartramia longicauda*. BARTRAMIAN SANDPIPER.— Rare.

169. *Oxyechus vociferus*. KILLDEER.— Rare.

170. *Ictinia mississippiensis*. MISSISSIPPI KITE.— Rare. Observed two or three times in four years.

171. *Circus hudsonius*. MARSH HAWK.— Rather rare. Observed two or three times each year in four years.

172. *Accipiter cooperi*. COOPER'S HAWK.— Tolerably common. Very shy.

¹ Widmann, Prelim. Cat. Birds Mo., p. 263.

² *Ibid.*

173. *Buteo borealis harlani*. HARLAN'S HAWK.—Rare. Only observed a few times.

174. *Buteo lineatus*. RED-SHOULDERED HAWK.—Common. Observed mostly in spring and fall.

175. *Buteo swainsoni*. SWAINSON'S HAWK.—Fairly common.

176. *Haliaetus leucocephalus*. BALD EAGLE.—Rather rare. Observed four or five times a year for four years.

177. *Otus asio*. SCREECH OWL.—Very abundant.

178. *Bubo virginianus*. GREAT HORNED OWL.—Fairly common. Observed in winter only, from ten to twenty times each winter for four years.

[24. *Coccyzus erythrophthalmus*. BLACK-BILLED CUCKOO.]—Rare.

[34. *Caprimulgus carolinensis*. CHUCK-WILLS-WIDOW.] Rare. Only heard twice in four years. (See preceding list.—E. S. W.)

Phalænoptilus nuttalli (?). POOR-WILL (?).—"Am reasonably certain of hearing the Poor-will once." W. G. S.

179. *Nuttallornis borealis*. OLIVE-SIDED FLYCATCHER.—Rather rare. Observed from one to three times each year for four years.

180. *Spizella monticola*. TREE SPARROW.—Rather rare. From 8th to 10th of February of each year for the last three years, have observed from 2 to 8.

181. *Guiraca cærulea*. BLUE GROSBEAK.—Common. Breeding quite abundantly.

182. *Petrochelidon lunifrons*. CLIFF SWALLOW.—Rather rare. Only observed in spring and fall.

183. *Riparia riparia*. BANK SWALLOW.—Rare. Only identified two or three times in four years.

[94. *Bombycilla cedrorum*. CEDAR WAXWING.]—Fairly common. May be looked for any time of year in small flocks, except in June and July.

184. *Vireosylva gilvus*. WARBLING VIREO.—Very rare. Only heard once.

185. *Vireo belli*. BELL'S VIREO.—Rare. Only observed a few times here.

186. *Protonotaria citrea*. PROTHONOTARY WARBLER.—Rather rare. Observed three or four times in four years.

187. *Helminthophila chrysoptera*. GOLDEN-WINGED WARBLER.—Rare.

[115. *Dendroica castanea*. BAY-BREASTED WARBLER.]—Rather rare.

188. *Dendroica palmarum*. PALM WARBLER.—Rare. Only observed two or three times here in four years.

[131. *Wilsonia canadensis*. CANADIAN WARBLER.]—Rather rare. Observed several times in four years. Not seen in fall.

189. *Hylocichla fuscescens*. WILSON'S THRUSH.—Rare. Only observed two or three times. (This may have been the western form—the Willow Thrush [*H. f. salicicola*], as Missouri must lie within the range of the latter.—E. S. W.)

GENERAL NOTES.

Occurrence of a Dovekie at Port Washington, Wis.—On January 11, 1908, some boys hunting along the ice fringe of Lake Michigan at Port Washington, about twenty-five miles north of Milwaukee, shot a bird which was strange to them and which they carried to Dr. C. W. Beemer of that town for identification. Dr. Beemer correctly determined it as a Dovekie (*Alle alle*) and had it mounted by a local taxidermist. He has since presented it to the Public Museum of the City of Milwaukee. The sex was not determined. The bird appears to be an adult in ordinary winter plumage.

I believe that this is the first record for this bird as far west in the United States as Wisconsin. Its presence was presumably accidental, storm-driven, rather than a voluntary straying from its coastwise habitat.—HENRY L. WARD, *Milwaukee, Wis.*

An Addition to the Birds of Iowa.—The Museum of Natural History of the University of Iowa, at Iowa City, obtained a fine female specimen, in good plumage, of the Long-tailed or Arctic Jaeger (*Stercorarius longicaudus*), which was captured near Lone Tree, Johnson County, Iowa, on or about June 15, 1907. The bird was seen flying around with the pigeons on the farm of Mr. Charles Prizler, near Lone Tree, and a shot from his gun broke the bird's wing and enabled Mr. Prizler to capture it alive. The bird was brought to Iowa City and presented to Professor C. C. Nutting, of the department of Zoölogy, and identified by him. I saw the bird two or three days later, after it had been mounted by Mr. Homer R. Dill, the University taxidermist, and verified the measurements and identity. The coloration and measurements are those of the typical adult, as given in Coues's 'Key' and Ridgway's 'Manual.' I know of no previous record of the occurrence of the Long-tailed Jaeger in Iowa, although its congener, *Stercorarius parasiticus*, has been taken at least twice; once on the Mississippi at Keokuk, Oct. 6, 1896, and preserved by Mr. Wm. G. Praeger, and one specimen at Eagle Lake, Hancock County, Sept. 20, 1905, and now in the Coe College collection at Cedar Rapids, Iowa, recorded by Dr. B. H. Bailey.—RUDOLPH M. ANDERSON, *Macon, Missouri.*

The Black Tern at Camden, N. J., and Philadelphia, Pa.—In 'The Auk' for April, 1907, page 211, I recorded the observation of a Black Tern (*Hydrochelidon nigra surinamensis*) on the Delaware River at Philadelphia, Pa., but as the bird was not taken there appears to be some doubt, in the minds of some ornithologists, at least, as to the reliability of my identification, and in this connection I would like to assure the most incredulous that I made no mistake, for if I had been in the least doubt, I certainly would never have recorded its occurrence. However, I am now able to

record the actual capture of the Black Tern on the Delaware River in the vicinity of Philadelphia, which ought to satisfy the most doubting that this bird does occasionally occur in this locality.

On September 5, 1907, Mr. Richard C. Harlow, of Edge Hill, Pa., and the writer saw about 75 Black Terns, while gunning on the Delaware River, behind Petty's Island, at Camden, N. J., which is opposite Philadelphia, and secured six immature birds. In fact, all seen were juveniles. On September 10, about 50 Black Terns were seen by us at the above locality, and also at Philadelphia, and eight were taken. As before, all seen and shot on this day were immature birds. On the 5th they kept behind the island along the Jersey shore marshes, but on the 10th several were seen elsewhere than out on the river, and often observed resting on pieces of driftwood, singly, in pairs, and threes, floating with the tide.

The specimens taken are in Mr. Harlow and the writer's collection, except two which were given to Mr. Witmer Stone, and fill a gap in his fine collection of local birds. The Terns were undoubtedly a migrating flock driven inland by a recent storm.—RICHARD F. MILLER, *Philadelphia, Pa.*

Another Capture of a Tagged Duck.—In 'The Auk' for January, 1908 (Vol. XXV, p. 80), Mr. Henry Oldys calls attention to the capture of a hen Canvasback Duck on October 25, 1907, at Manahawkin Bay, New Jersey, on whose leg was an aluminum band marked 'T. J. O. D. 48.' In 'Forest and Stream,' November 16, 1907, there is recorded the shooting of a female Redhead Duck in the first week of November, 1907, at Beach Haven, New Jersey, which had a similar band on its leg marked 'T. J. O. D. 49.' It would be of interest to learn where, how, when and by whom these birds were banded.—E. SEYMOUR WOODRUFF, *State Forester, Albany, N. Y.*

The Cinnamon Teal (*Querquedula cyanoptera*) on the Coast of South Carolina.—In 'The Auk,' Vol. XXIV, 1907, p. 157, Mr. William Brewster has shown that the bird I recorded (Auk, Vol. XXII, 1905, p. 396) as a representative of this species is really the Blue-winged Teal (*Querquedula discors*). Upon verifying some ducks in the Charleston Museum recently, I noticed a specimen bearing the following label, written by the late Dr. Gabriel E. Manigault, when he was the curator: "Blue-winged Teal *Querquedula discors* ♀." The extreme narrowness of the bill at once arrested my attention, it measuring but .50 of an inch, and the culmen (from feathers), 1.67. Although there is no locality on the label, the specimen was unquestionably bought of one of the game dealers in the Charleston market by Dr. Manigault, who daily visited the market during the winter months for the purpose of securing ducks for the Charleston Museum. This specimen, I am certain, is really a representative of *Querquedula cyanoptera* and was evidently killed on the Cooper River, the supply of ducks for the market usually coming from that region.

This duck was mounted by the late Mr. John Dancer, who was employed by Dr. Manigault to mount birds for the Charleston Museum, and was taken probably in the winter of 1884 or 1885.

Dr. Manigault was not in the habit of affixing localities to specimens (despite my protestations) taken in South Carolina, for he regarded the Charleston Museum as not a museum of science, but one to attract the public generally.

Although the specimen is labeled "♀" there can be little doubt that it is a young ♂, for the speculum is rich, uniform green.—ARTHUR T. WAYNE, *Honorary Curator Div. Birds, Charleston Museum.*

Barrow's Golden-eye (*Clangula islandica*) in **Massachusetts**.—As this bird seems to be of rare occurrence in Massachusetts I would like to call attention to its having been taken at Nantucket on December 17, 1906. It was a male specimen in the adult plumage and was shot by Charles C. Chadwick, a native of the island, and whom I have had occasion to go shooting with several times. The bird was shot at the eastern end of the harbor where there is an opening into the ocean known as Haulover Break. At daylight and until sunrise a large flight of sea fowl streams through here on their way to the feeding grounds in the harbor. They consist mostly of White-winged Scoters (*Oidemia deglandi*), American Golden-eyes (*Clangula clangula americana*), Old-squaws (*Harelda hyemalis*), and a few Red-breasted Mergansers (*Merganser serrator*); this latter bird being very common later on in the spring. The bird in question was shot at this time during the flight, and was flying singly. Chadwick was unable to identify the specimen but supposed it to be a freak *Clangula clangula americana*. He showed it to several of the oldest gunners on the island but none had ever seen one like it before. Unfortunately the bird was destroyed in ignorance. I have been unable to find any recent records of the capture of this bird in Massachusetts and I believe it is considered a rare bird here, though a few are occasionally taken in Maine.—S. PRESCOTT FAY, *Boston, Mass.*

The Whistling Swan (*Olor columbianus*) in **South Carolina**.—I am indebted to Dr. Jonathan Dwight, Jr., for the gift of a bird of this species taken at Ridge Springs, Edgefield County, on November 26, 1907. The specimen was shot in a small pond and seemed to be very tired. It was sent by Dr. L. J. Smith to Mr. James P. Garick, Jr., of Weston, S. C., to be mounted, who (the latter) upon learning of my desire to obtain it for my collection kindly used his influence in my behalf. Mr. Garick informs me that the bird was greatly emaciated, in fact 'skin and bone,' but despite its condition it measured (in flesh) 52 inches in length and 84 inches in extent.

This Swan, although a *young* male and doubtless a bird-of-the-year, has the legs and feet deep *black* as in the *adult*.

In Audubon's 'Birds of America,' Vol. VI, p. 232; Baird, Brewer and Ridgway, 'Water Birds,' Vol. I, p. 425; Coues's 'Key to N. A. Birds,' p. 683; Ridgway's 'Manual of N. A. Birds,' p. 120, and Chapman's 'Birds

of Eastern North America,' p. 124, the color of the feet of the *young* is described as "yellowish flesh-color," "grayish, or whitish," and by the last-named author as "light."

Although the Whistling Swan winters in great numbers on the northern coast of North Carolina, there are but few authentic records of the capture of these magnificent birds for this State.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Capture of the King Rail in Massachusetts.—I would like to report the taking of a fine male King Rail (*Rallus elegans*) on October 10, 1907, on the Charles River marshes, Needham, Mass. The bird has remarkably fine plumage for that season of the year, and was extremely fat.—FRED. H. KENNARD, *Boston, Mass.*

Nesting of the King Rail in Philadelphia County, Pa.—The King Rail (*Rallus elegans*) is a very rare breeder nowadays — if it ever was a common one — in the Delaware Valley and the discovery of a nest is worth reporting, especially when found in the vicinity of Philadelphia, and particularly within the city limits. Bridesburg, on the Delaware River, is about five miles from the City Hall and well within the city limits. In the meadows at this locality it was my good fortune to find a King Rail's nest on June 3, 1902. It was placed half a foot up in a clump of reeds, two feet high in a shallow marsh, woven to the blades and stalks, the tops being pulled down and interwoven into the nest and formed a sort of arch over it. It contained two fresh eggs, which were taken and are still in the writer's collection, probably the only eggs of *Rallus elegans* from Philadelphia in collections.

A week or so later the dead rail was found in a ditch near the nest and its skull (which I still have) collected; the bird being partially decomposed, it was useless as a skin or for mounting.

On June 26, 1907, I found a deserted King Rail's nest not a square away from the site of the other, placed on muddy water in a shallow marsh amid tussocks and thin and scattered stalks of cat-tails, along the edge of a cat-tail marsh.

These are the only King Rail's nests I have been able to find in North Philadelphia, after diligent search for them during the past six years.—RICHARD F. MILLER, *Philadelphia, Pa.*

Virginia Rail and Kentucky Warbler in New Jersey.—In the January issue of 'The Auk' I noted Mr. Hunt's observations of these species on the Pensauken Creek, New Jersey. A few words on this subject may not be amiss, as I fear a wrong impression of the rarity of these species is given here. The Virginia Rail is rarely observed by the casual ornithologist, but nevertheless it is a perfectly regular summer resident in suitable marshes throughout the Delaware Valley. In my several trips to the Pensauken region I have not infrequently observed or heard the Virginia Rail and

have not the slightest doubt but that a careful search will prove it decidedly common in that locality.

Mr. Hunt's record of the Kentucky Warbler is considered by him to be the only record from southern New Jersey. On July 3, 1904, I observed two individuals of this species at Manahawkin, a locality still more southern than Pensauken where I again observed it on May 21, 1907. Though undoubtedly rare, it is probably of regular occurrence.—RICHARD C. HARLOW, *Edge Hill, Pa.*

Rallus virginianus Breeding in the Delaware Valley.—In 'The Auk' for January, 1908, p. 81, a correspondent appears to infer that the nesting of the Virginia Rail is rare in the location above mentioned. I find already recorded the nesting of this species as follows: In the 'Abstract of Proceedings of Delaware Valley Ornithological Club, Vol. IV, p. 5, three nests on the Delaware marshes below Philadelphia. In 'Cassinia' for 1903, p. 51, two nests at Richmond, Philadelphia, in the river marshes. In 'The Oologist,' Vol. III, p. 46, there is a record of five nests of this bird found in Chester County, Pa. One of these sets is in my collection. In 'The Oologist,' Vol. IV, p. 2, two additional nests are recorded from the same locality. This bird breeds not uncommonly in the extensive marshes along the Delaware River and its tributaries to at least twenty-five miles south of Wilmington, Del. I have a set of 7 eggs collected near Odessa, Del., July 19, 1903, and I have seen the bird in the nesting season near Rehoboth, Del., just below Cape Henlopen, and almost one hundred miles south of Philadelphia, Pa.—C. J. PENNOCK, *Kennett Square, Chester County, Pa.*

Nesting of the Virginia Rail in Philadelphia County, Pa.—During ten years or more of persistent search the writer has failed to find more than two nests of the Virginia Rail (*Rallus virginianus*) in north Philadelphia County, Pa., and consequently regards the bird as a rare summer resident. The two nests in question were found on May 28, 1903, in a marsh at Richmond, Philadelphia, well in the city limits, and to my chagrin they were subsequently deserted.

Several times the birds have been since seen during the summer, and a diligent search made for their nests, but without success.—RICHARD F. MILLER, *Philadelphia, Pa.*

Nesting of the Coot in Philadelphia County, Pa.—The Coot (*Fulica americana*) is a common transient in the Delaware Valley, and has always been regarded as such by the writer, despite suspicious stories of its occurrence during summer told to me by gunners of questionable veracity. This was my belief until the summer of 1906, when I learned of the undoubted breeding of the Coot in this district.

On August 21, 1906, a gunner observed a Coot with six half grown young swimming together in a reedy tide-water pond at Richmond, Philadelphia,

not more than five miles from the City Hall, and well within the city limits. His description of the birds — Chicken-billed Ducks he called them — precluded any doubt as to their identity, the white frontal shield plate of the adult being a conspicuous identification mark.

On the same day another gunner shot a Coot on this pond whose identity was ascertained by the writer, thus confirming the observation of the other gunner, and proving conclusively that the Coot bred here. The following year, 1907, I hunted in vain for a Coot's nest in the marsh, in fact did not see a bird nor hear of any being shot in it.

This is the only record of the Coot breeding in the vicinity of Philadelphia known to me.— RICHARD F. MILLER, *Philadelphia, Pa.*

American Woodcock Breeding at Saint Marys, Ga.— Although a friend some few years ago told me that he had seen an American Woodcock (*Philohela minor*) with small young, about twenty-five miles from here on the Satilla River, I have found the bird so rare, even during winter, that I had about decided that he was mistaken. I was therefore both surprised and pleased on the morning of March 9, 1908, to flush a bird from a set of four eggs while riding through a thicket of bushes about three feet high in a rather low place on the edge of a swamp. I was riding slowly at the time, trying to identify a small bird, and my horse's feet were almost in the nest before the bird quit it, rose above the bushes and settled down again about twenty feet away. The nest was of leaves and a little pine straw, and I found that incubation would have been over in a few days, but managed to save the eggs. The nest was about four miles from Saint Marys, and the Florida line, which I believe is the most southerly breeding record for the bird. Have only seen one other bird this year.— ISAAC F. ARNOW, *Saint Marys, Ga.*

The Lesser Yellow-leg in Philadelphia County, Pa.— On May 13, 1901, at Frankford, Philadelphia County, Pa., I saw a flock of six Lesser Yellow-legs (*Totanus flavipes*) feeding in a shallow ditch bordering a large wood and wading about, often belly-deep, in the water in quest of food. They were watched for about ten minutes and were quite tame, allowing a close approach. When flushed they took wing together, uttering their characteristic shrill cries as they rose and circled around, and then flew off northward.

The Summer Yellow-leg is only mentioned in Stone's 'Birds of Eastern Pennsylvania and New Jersey' as "Common transient on the coast and less frequent on the larger streams" (p. 76). There are no reliable records of its occurrence in the vicinity of Philadelphia, and Fowler in his 'Water Birds of the Middle Delaware Valley' (Cassinia for 1903, p. 43) does not mention the bird. When I contributed my notes to Mr. Fowler regarding the Water Birds of Frankford and Vicinity I overlooked the observation of this species, consequently it was not recorded in his excellent paper.— RICHARD F. MILLER, *Harrougate, Philadelphia, Pa.*

Breeding of the Acadian Owl in Newton County, Indiana.— Another actual breeding record of the Saw-whet Owl (*Nyctala acadica*) in Indiana will doubtless be of interest, at least to local ornithologists. In July, 1907, I saw at a farm between Kentland and Effner, not far from the Illinois line, a family of these birds, parents and several young. The people living on the farm had watched the development of the family throughout the summer, and the birds being very tame I was able to observe them, during the late afternoon hours, at close range. The nesting site was in a lawn shade tree close to the house.— N. HOLLISTER, *Biological Survey, Washington, D. C.*

Glaucidium vs. Noctua — A Correction.— In 'The Auk,' Vol. XXIV, p. 192, I proposed to substitute *Noctua* S. G. Gmelin, 1771, for *Glaucidium* Boie, 1826, on the supposition that they were based upon the same species. Gmelin based his genus upon *Noctua minor* Brisson which is a "*Glaucidium*" and the case seemed clear enough. Unfortunately for my argument there is sometimes a difference between what an author has and what he thinks he has; and the plate which was lacking in the volume of the Nov. Com. Sci. Petr., XV, in the Academy library, but which I have since examined in Washington, shows Gmelin's bird to have been a Short-eared Owl, *Asio accipitrinus*, and not the "*Noctua minor* Briss" at all! A genus based upon a misidentified species is liable to cause a great deal of trouble, and our only safe course seems to be to let the case rest wholly upon the published evidence. Had there been no plate in this case my proposed change would have been inevitable, but the plate saves the day for *Glaucidium*.— WITMER STONE, *Academy of Natural Sciences, Philadelphia, Pa.*

European Starlings (*Sturnus vulgaris*) in Pennsylvania, New Jersey, and Delaware.— In July, 1904, through Prof. H. A. Surface, State Zoölogist of Pennsylvania, I was placed in correspondence with Dr. W. H. Ridge of Trerose, Bucks Co., Pa., relative to a pair of curious birds that had established themselves near his house. The birds, which proved to be Starlings, arrived in the spring of 1904 and raised a brood in a hole in the cornice of the house. The young left as soon as they were able to fly, while the old ones remained until the following February when they, too, left. Nothing has been seen of them since. In spite of Prof. Surface's adverse report on their desirability, Dr. Ridge declares that while he likes Martins he would prefer the Starlings if he could only get them back.

In March, 1905, Miss F. L. Twaddell wrote to me of some interesting birds that had occurred at intervals all winter on her grounds in West Philadelphia and about Woodland Cemetery. These also proved to be Starlings, and are still present. In March, 1907, they nested in a Flicker's hole, after driving the Flickers away, and raised a brood. Miss Twaddell has never seen more than four or five at one time, presumably the original pair and three young.

A letter from Miss Anna P. Hannum, dated February 3, 1908, reports the

arrival of a flock of Starlings at Vincenttown, N. J., at the home of Mr. Lewis Prickett, about two years ago. The birds have remained ever since, nesting in bird boxes and about the barn, and are highly prized by the residents of the farm.

Other Starling records that have come to my notice are a bird examined in the shop of Mr. Axe, a Philadelphia taxidermist, by Mr. R. F. Miller, shot early in November, 1907, along with another individual at Tacony, Philadelphia, on the Delaware. A specimen in the possession of Mr. Philip Laurent, was shot on the Meadows below Philadelphia, December 15, 1907, by David Bouvier; five others were seen at the same place December 22.

A specimen now in the Academy collection, was shot from a flock at Tuckerton, N. J., by Mr. Joseph Sapp, early in December, 1907.

Mr. C. J. Pennock writes me that the bird has also reached Delaware. He examined one of three that were shot on the Bay Shore near Smyrna, November 15, 1903. A large flock was seen in the same vicinity about ten days later.—WITMER STONE, *Academy of Natural Sciences, Philadelphia, Pa.*

Another Clarke's Crow taken in Missouri.—Mr. E. A. Dodge of Louisiana, Pike Co., Mo., sent me a photograph of a Clarke's Crow, *Nucifraga columbiana* (Wils.), which was killed by Mr. Mike Creamer near Louisiana on October 12, 1907. It was mounted by Mr. Dodge and is now in his collection. With the exception of a specimen taken April 1, 1891, in Crittenden Co., Ark., this is the farthest eastern occurrence of the species.—O. WIDMANN, *St. Louis, Mo.*

Bobolinks Summering in Southern Pennsylvania.—Perhaps it might interest some readers of 'The Auk' to learn that for some years past there have been several localities within twenty miles of Philadelphia where the Bobolink (*Dolichonyx oryzivorus*) reared its young. Chapman, in his 'Handbook,' gives its southern summer range as "southern New Jersey," and despite assiduous searching, my efforts to find a more southerly record for the east have been vain. It is with the view of establishing a new locality that this is written.

In the summer of 1906, I spent the time from the latter part of June till the corresponding portion of July in the vicinity of Bristol, Bucks Co., Pa., and within eighteen miles of Philadelphia. Here I observed the Bobolink frequently and often saw the parents in the act of feeding the young. From reliable informers I gathered that the birds were no more abundant that year than usual. Again, in the spring of 1907, I was in the vicinity of Newtown, Bucks Co., and saw several pairs of the birds, the males in full song. Here I was in company with J. Harris Reed, and he informed me that the birds were usually to be found there throughout the summer, and that several years since he had discovered a nest in that locality. Several days later, on June 9, I spent the day on the Tinicum meadows to the south of Philadelphia, and what was my surprise to see several males (three) in full song. Again on the 14th they were seen in the same locality, which

is below the 40th parallel, North Latitude, and though I do not assert that they always summer here, I do maintain that they did during 1907.—
RICHARD C. HARLOW, *Edge Hill, Pa.*

The Savanna Sparrow Breeding in Detroit and Hamtramck Village, Michigan.—One especial ornithological feature of the season 1907 was the appearance of Savanna Sparrows (*Passerculus sandwichensis savanna*) as summer residents on territory not previously occupied by them. Prior to 1906 this sparrow was not known to breed in the county but that season I located a small colony in the village of Grosse Pointe Farms and established a positive breeding record by securing a young bird not yet able to fly well (Auk, XXIV, p. 98). The grounds extending northerly from this colony to the county line and southerly into the city of Detroit were carefully explored without result, but in 1907 this sparrow was common in all suitable places throughout this entire territory. In late May, 1906, I spent considerable time on some large commons in the eastern part of the city and carefully noted all birds, but no Savannas were present. I was again on this commons May 28, 1907, and found them all over it; six males in song being counted while standing at one point. During the noon hour I watched a female to her nest containing four slightly incubated eggs. This was about fifty yards inside the city limits on P. C. 644. In June, 1906, I frequently walked the length of a strip of meadow bordering the Detroit River in River Rouge Village and saw only Vesper Sparrows, but June 3, 1907, six pairs of Savanna Sparrows were present and frequently seen later; and thus it was with portions of Hamtramck, Springwells and Ecorse Townships. The birds were also found in many places not visited in 1906. July 30, 1907, I found this species common and in full song on Section 6, Monguagon Twp.; the southernmost point I reached during the summer. It is thus evident that the breeding range of this sparrow in numbers was extended southward in 1907—a phenomenon possibly explained by the abnormal weather conditions. I have no doubt that isolated pairs frequently nested here in former years and were overlooked. I have substantial proof of this in the possession of a set of five fresh eggs taken by Mr. Herbert H. Spicer, May 28, 1902, in $\frac{1}{4}$ Section 39, Hamtramck Village. The territory, over which the Savanna Sparrow was a summer resident in 1907, extended from the shore of Lake St. Clair and the Detroit River inland about three miles, and from the north county line southerly a distance of twenty-five miles to Section 6, Monguagon Twp., and probably further. At a few points in Gratiot and Springwells Twps., Highland Park, etc., the birds were noted from one to three miles further inland.—J. CLAIRE WOOD, *Detroit, Mich.*

The Case of *Hortulanus Vieillot*.—In my recent paper on the 'Types of Genera of North American Birds,'¹ I took the ground (*l. c.*, p. 23, footnote)

¹ A List of the Genera and Subgenera of North American Birds, with their Types, according to Article 30 of the International Code of Zoölogical Nomenclature. Bull. Amer. Mus. Nat. Hist., Vol. XXIV, pp. 1–50, December 26, 1907.

that *Hortulanus* Vieillot, 1807, had no standing under the new Article 30 of the International Code of Zoölogical Nomenclature, inasmuch as the author failed to designate its type when founding it, and later ignored it, transferring its three original species to other genera founded by him later, one of these species becoming the type of another genus, and the other two becoming types by subsequent designation of still other genera, the genus *Hortulanus* not having in the meantime been cited by any other author, except in synonymy, and without designation of a type. Since the publication of this dictum several correspondents have written to me taking exception to it, on the basis, apparently, that a genus properly published cannot be ignored, and if not a homonym must be retained for some one of its original species. (See A. O. U. Code, Canon XIX.)

As already shown elsewhere,¹ the three original species of *Hortulanus* are (1) *Hortulanus erythrophthalmus* (= *Fringilla erythrophthalma* Linn.), which became the monotypic type of *Pipilo* Vieill. in 1816. (2) *Hortulanus albicollis* (= *Fringilla albicollis* Gmel.); which became type by designation of *Zonotrichia* Swains. 1831 in 1832. (3) *Hortulanus nigricollis* (= *Emberiza americana* Gmel.), which became the type of *Spiza* Bonap. 1824 by subsequent designation of the founder in 1827.

If *Hortulanus* is to be retained as a properly founded generic name, the application of the rule of priority to the case would make *Fringilla albicollis* the type, and *Zonotrichia* a synonym of *Hortulanus*.—J. A. ALLEN, *American Museum of Natural History, New York City.*

The Accidental Occurrence of the Green-tailed Towhee (*Oreospiza chlorura*) in Virginia.—Mr. John B. Lewis captured a male of this species at his home, one mile west of Bower's Hill, Virginia, on January 26, 1908, which was subsequently sent to me for identification. The bird was first discovered by his fourteen year old son, in company with White-throated Sparrows, in a thicket along the edge of an open field, and Mr. Lewis stated that its actions resembled very closely those of the sparrows. Bower's Hill is about seven miles southwest of Portsmouth, and within a mile of the border of the Dismal Swamp.

So far as I can find, there is no other published record of the Green-tailed Towhee east of San Antonio, Texas.

The specimen in question, although in very poor condition when received, was immediately preserved and is now in the writer's collection.—G. C. EMBODY, *Ashland, Va.*

Type Locality of *Vireo pusillus*.—It is unfortunate that Mr. Grinnell (see Auk, January, 1908, pp. 85, 86) was not able to consult the original description of *Vireo pusillus*, for if he had done so it would have been quite clear to him that the type specimen—that is, the specimen on which the description was based—is given as "No. 16,954, Smiths. Register, ♂,

¹ Bull. Amer. Mus. Nat. Hist., XXIII, p. 360, April 15, 1907.

Cape St. Lucas." That Dr. Coues, at that time, was in the habit of designating types in connection with new species which he described is clearly shown by his action in the case of *Dendroica graciae* (p. 67), *Vireo plumbeus* (p. 74), and *V. vicinior* (p. 75). In the case of the last, only, does he take the trouble to use the word type ("Type and only known specimen No. 1507 of my collection," etc.); but even if his intent was not thus perfectly evident, the mere fact that only one specimen is mentioned in connection with his original description of the new species (*Vireo pusillus*), that from Cape St. Lucas, necessarily fixes that specimen as the type, according to the very general and perfectly correct practice in such cases. His designation, twenty-two years later, of another specimen as type may properly be regarded as a mere lapse of memory; but even if not so regarded, the answer may be made that an author has no more right to change his type of a particular species than to change its name without (in the latter case) good reasons for doing so.—ROBERT RIDGWAY, *Washington, D. C.*

Swainson's Warbler (*Helinaia swainsoni*).—On the afternoon of June 17, 1907, Mr. Howard Ray and myself had the good fortune to see, and hear, the rare Swainson's Warbler. It was found about four miles north of Du Quoin, Perry County, Illinois, in a narrow but tall and dense growth of willows, which bordered a low, wet pastureland. As we entered the thicket, our attention was attracted by the loud whistle of some new bird. Going in the direction from which the call came, we found a plain-colored warbler perched about twenty feet from the ground among the smaller branches of the willows. It did not notice us at first, but seemed to put all its spirit and energy into its song. The upper parts of this bird were olive brown, the superciliary line dull white, the under parts dusky white slightly tinged with yellow, and the crown a dull reddish brown, approaching the extreme dull color variation described by Mr. Brewster.¹ Unfortunately we had no gun with us and were unable to make a subsequent visit to that locality. There are extensive areas of low, swampy timberland along the Little Muddy River, which contain an abundance of aquatic vegetation and dense shrubbery that are doubtless attractive resorts for this swamp-loving species.

The only other record of this bird in Illinois, as far as I have been able to discover, is that made by Mr. Robert Ridgway and Mr. Brewster in the vicinity of Mount Carmel, southern Illinois, in the spring of 1878.²—ALFRED O. GROSS, *Urbana, Ill.*

Late Occurrence of the Black-poll Warbler (*Dendroica striata*) in the District of Columbia.—As is well known, the belated spring weather of 1907 affected the birds in almost every locality in the eastern United States;

¹ Auk, Vol. II, 1885, p. 87.

² Bulletin N. O. C., Vol. III, p. 163.

hence one erratic record would seem too trivial for publication, but it has occurred to me that the note I now make may possibly be of comparative interest. Black-poll Warblers are usually the last of the warblers to reach the District of Columbia in spring. They are likewise among the last to leave it. Singularly enough, in the spring of 1907 they were a little in advance of their average date of arrival. They lingered in more or less abundance throughout the first ten days of June. I recorded the last on June 16, in the grounds of the National Zoölogical Park. The latest record theretofore was June 6, 1875, but this was not strictly a District record, having been made at Rosslyn, just across the Potomac River, in Virginia.—R. W. WILLIAMS, JR., *Washington, D. C.*

The Cañon Wren in Colorado.—As I believe this Cañon Wren (*Catherpes mexicanus conspersus*) is considered rather rare in Colorado, the following note may be of interest. February 22, 1907, I obtained a pair of these Wrens in a small rocky gulch about two miles south of Golden. Both seemed rather shy, but after shooting the first one the other remained around the same spot so that I was able to obtain it. October 10, while in the same gulch I saw another Cañon Wren near where I had obtained the two in February. I think it probable that these birds breed in this locality and perhaps are not as rare as has been supposed.—CHARLES D. TEST, *Golden, Col.*

Red-spotted Bluethroat of Alaska.—While not at all questioning the correctness of Dr. Buturlin's opinion that the Bluethroat of Alaska is different from that of Northern Europe (see Auk, January, 1908, pp. 35–37), I wish to state that both the description and measurements in 'Birds of North and Middle America' (Vol. IV, p. 15) were taken from European specimens, and that I have not seen specimens from either Alaska or eastern Siberia. Of course I should have so stated in the work mentioned, but unfortunately neglected to do so.—ROBERT RIDGWAY, *Washington, D. C.*

A Black Robin and its Albinistic Tendencies.—In November last my attention was called to a caged Robin in this city that had suddenly turned black. I found the bird to be a lively, pugnacious and apparently healthy robin exhibiting a very complete case of melanism. Its plumage was jet black except for a few small, white under tail coverts, apparently two in number, and that when facing the light and viewed at a certain angle the breast feathers appeared to be terminally banded with blackish brown not distinguishable in other positions. The eye-ring was not noticeable, bill nearly black, anterior surfaces of tarsi and dorsi of toes heavily pigmented with blackish slate while the plantar surfaces of these were whitish flesh slightly interrupted by slate color.

The history of this bird, as given me by its owner and corroborated by a local physician who has known it for the last three and a half years, is

that it was taken as an abandoned nestling some four years previous and kept in a large cage hung in a kitchen and fed on a diet of ground hemp, grated carrot and cornmeal varied by an occasional small bit of apple, a minute quantity of scraped raw meat about once a week, and in spring time occasional meals of angle worms. Thirteen months ago last November the robin was moved from its original habitat to its present home where it hangs in a large wire cage suspended about five feet from the floor in front of a south window in a rather low kitchen. The room is not used for washing, and but little cooking is said to be done in it, and its temperature is said to be cool; but not unlikely it may be a little higher and more humid than normal.

Up to the latter part of last September, when its moult began, the robin had been in rather bright, normal coloration which at once gave place to the extreme melanistic phase that it had assumed about two weeks previous to my seeing it, November 6. Again, on January 28, I called to see the robin and found that the black pigmentation of the bill had almost entirely disappeared and that it was bright yellow except for a dusky spot near the tip of the culmen, a change that I was told had occurred within the preceding four days. The eye-rings were then conspicuous, appearing whitish at a distance but really greenish yellow. The tarsi and toes were decidedly lighter, the pigment of the former seeming to have formed ill-defined spots. About a week previous to this inspection white feathers were noticed by the owner in several parts of the plumage as the bird sat with erected feathers after bathing. I could see a number of these, imperfectly covered by the black ones, and a faint indication of fine white streaking, probably due to underlying white feathers, was seen on the breast. On February 10 I again viewed the robin and found the dusky spot on its culmen farther reduced, and there were then apparently three or four white under tail coverts. As the bird is lively and attempts always to face an observer it was impracticable to determine whether there was a farther increase in the underlying white feathers of the body and neck.

Coues¹ mentions a black robin turning white, and Barrows² mentions a robin "somewhat variegated with black and white, the black predominating above, though Mr. Leonard thinks the bird became ultimately almost white."

It appears that in the majority of black captive robins there has been a succeeding albinistic phase.

As melanism is due to an abnormal increase in black pigment or melanin it seems but natural to suppose that a more or less lengthy persistence of such a condition would produce an exhaustion of the supply and of the ability to renew it which would result in albinism more or less complete, depending on the degree of exhaustion. There is, I believe, little data to support such a theory and it would have to be obtained experimentally

¹ Coues, Elliott, Bull. Nutt. Ornith. Club, Vol. III, p. 48.

² Barrows, Walter B., Auk, Vol. II, p. 303.

much as Beebe¹ has obtained that indicating the probable inducing causes of melanism in caged birds subjected to slightly abnormal degrees of heat and humidity; a result in conformity with Faxon's² hint of over twenty years ago. — HENRY L. WARD, *Milwaukee, Wis.*

An Interesting Audubon Specimen. — It has long been known that many of Audubon's specimens were deposited in the Charleston Museum toward the close of 1850. Lack of space forbids going into details, so it must suffice to say that, while it is certain that these specimens were at one time in this Museum, we do not know just what species were represented and, until recently, had been unable to find any trace of Audubon's birds among our collections — which contain many very old specimens. Probably most of the records and perhaps most of the specimens were among material destroyed during the Civil War. Recently, however, while examining some old and damaged specimens which had been stored away for many years, I found a bird which is apparently an Audubon specimen. It bears two labels. The first, a piece of cardboard tied to the bird's leg, reads as follows:

"*Loxia maculata* Gmelin

Spotted Grosbeak — Pennant"

The second, consisting of a scrap of paper folded up and attached to the string of the other label, bears the inscription:

"Black Hills

Male

June 3 — 34

J. K. Townsend"

Mr. Witmer Stone has kindly examined both these labels and informs me that the second one is in Townsend's handwriting.

The specimen is in reality a representative of the Black-headed Grosbeak — *Zamelodia melanocephala* (Swainson). The assumption that it is an Audubon specimen is based on the following facts:— (1) that some of Audubon's birds were once in this Museum; (2) that Audubon received some of the Western birds from which he drew his figures from Townsend and that these birds of Townsend's were examined and figured by Audubon in Charleston in 1836 (see *Ornith. Biog.*, Vol. IV, *Introd.* pp. xii-xiv); (3) that this specimen was taken by Townsend on the same day, month, and year and in the same locality as the female Evening Grosbeak figured by Audubon and received by him from Townsend (see *Ornith. Biog.*, IV, p. 517).

In his 'Narrative of a Journey across the Rocky Mountains to the Columbia River . . . with a Scientific Appendix,' published in 1839, Townsend lists, among the birds collected, Mottled or Spotted Grosbeak, *Frin-*

¹ Beebe, C. William, *Zoologica*, Vol. 1, part 1.

² Faxon, Walter, *Auk*, Vol. III, p. 284. Other citations of black robins: Ruthven Deane, *B. N. O. C.*, Vol. I, p. 24; Barrows, *Auk*, Vol. 1, p. 90.

gilla maculata. This is the name used by Audubon in the 'Elephant Folio.' Since there can be little doubt that Audubon's figure of the male Black-headed Grosbeak was drawn from the specimen in this Museum, it is evident that the name *Fringilla maculata* was not, as supposed hitherto, a new one originating with Audubon. Furthermore, this name should certainly be considered a synonym of *Zamelodia melanocephala* Swainson, although Mr. Ridgway, in his 'Birds of North and Middle America,' does not include it as such.

Townsend seems to have confused the Black-headed Grosbeak with the Spotted Grosbeak — *Loxia maculata* of Gmelin, and out of this confusion arose the specific name *maculata* applied by Townsend and Audubon to the Black-headed Grosbeak. I am informed by Mr. Stone that the identity of *Loxia maculata* has never been determined and that it remains an unidentifiable (and probably merely hypothetical) species.—HERBERT RAVENEL SASS, *The Charleston Museum, Charleston, S. C.*

Three Erroneous Georgia Records.—COWBIRD (*Molothrus ater*).—In Mr. Ridgway's 'Birds of North and Middle America,' Part II, p. 208, the breeding range of this species is given as "south to Georgia (Wayne and McIntosh counties)." In the citations, however, no authority is mentioned for this breeding record. During the month of May, 1891, I was making observations on the birds of Wayne, McIntosh and Glynn counties but failed to detect the Cowbird.

This species does not breed on any portion of the South Carolina coast, and, if the birds really breed on the coast of Georgia (which is questionable), the breeding range would undoubtedly extend northward along the coast to South Carolina, as the Cowbird breeds far north. This Georgia record requires confirmation.

BANK SWALLOW (*Riparia riparia*).—Although the Bank Swallow is said by Mr. H. B. Bailey (Bull. Nutt. Orn. Club, Vol. VIII, 1883, p. 39) to breed on St. Simon's Island, he doubtless mistook migrating birds for breeding ones, as the Rough-winged Swallow (*Stelgidopteryx serripennis*) was the species I found breeding in May, 1891.

SHORT-BILLED MARSH WREN (*Cistothorus stellaris*).—Mr. H. B. Bailey, in Bull. Nutt. Orn. Club, Vol. VIII, 1883, p. 38, refers to this wren as breeding on St. Simon's Island. This statement is erroneous, as the Short-billed Marsh Wren does not breed in any portion of the South Atlantic States, the birds being simply autumnal, winter and late spring residents.

While Mr. Ridgway does not give the range (breeding and winter) in his great work (Birds of North and Middle America, Part III, p. 483), the so-called "breeding" record by Mr. Bailey is perpetuated in the citations. Since 1884 I have known that the birds are simply winter and late spring residents, and that their breeding range was far to the northward of the South Atlantic States. Mr. Ridgway's inclusion of Mr. Bailey's

unquestionably erroneous record was doubtless due to an oversight on his (Ridgway's) part, for he must have surely known that the species in question does not breed in the South Atlantic States.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Notes on Three Michigan Birds.—At the suggestion of Prof. W. B. Barrows, of the Michigan Agricultural College, I send a few notes gathered during the past summer. They are the result of a canoe trip down the Grand River, taken by a Mr. H. A. Moorman and myself. Although no remarkable finds were made, we succeeded in extending the supposed breeding range of two species, and in securing specimens of another rather uncommon resident.

At a point a few miles north of Jackson, Mich., we entered a remarkably large breeding area of the Prothonotary Warbler (*Protonotaria citrea*). The tract of low, water-covered land in which these birds were found extended, uninterrupted, for twenty-five miles on the river's course. Here this warbler was the most common bird encountered and, even after leaving this area, Prothonotary Warblers were met in several instances — our northernmost record being a few miles south of Lansing, Mich. The former breeding localities of this bird in our State were restricted to streams along the southern State line.

On July 7 a male Mourning Warbler (*Geothlypis philadelphia*) was taken at East Lansing. This bird, which was in full song and mating plumage, frequented the dense undergrowth in a tract of woods admirably adapted to its habits and, although no nest was found, I am fully convinced, from the date of capture and general surroundings, that it was a breeder there. Cadillac, in the northern part of the Southern Peninsula, was the former southern record for this bird.

The securing of three specimens of Henslow's Sparrow (*Coturniculus henslowi*), and the seeing of more in a low meadow near Eaton Rapids, help to establish more firmly the records in this State of a rather erratic and uncommon breeder.—EDWIN R. KALMBACH, *Asst. Director K. S. Museum, Grand Rapids, Mich.*

Corrections to 'A List of the Land Birds of Southeastern Michigan.'—In the 'Bulletin of the Michigan Ornithological Club' (beginning in Vol. IV, p. 14 and concluding in Vol. V, p. 43) was published 'A List of the Land Birds of Southeastern Michigan.' This contained a number of minor errors. The compiler's attention was directed to these several years ago but nothing has been done in the way of correction, so I have decided to take up the matter in the interest of exactness.

BALD EAGLE.—"A pair have been for many years on Elba Island. This should read Grosse Isle instead of Elba Island.

AMERICAN LONG-EARED OWL.—"J. Claire Wood has taken several sets." I have taken but one set in Michigan; a set of five eggs April 17, 1886.

NORTHERN RAVEN.—"J. Claire Wood saw a pair in 1885." This pair was noted near Windsor, Ontario, Canada, late in February, 1887. I have not seen the Raven in this part of Michigan nor do I know of anyone who has during my time, so it is doubtless of rare occurrence on the Canadian side of the Detroit River and I give a more detailed account for the benefit of Ontario compilers. The identification is beyond question. I was a short distance beyond the limits of Windsor, on the main road leading back from the river, when a sound reached my ears different from anything previously heard. It suggested the honking of wild geese or herons, but one glance at the birds and I knew they were ravens. They were directly over Windsor and circling like Buteos, but gradually working away from the river and toward me. They passed within a hundred yards, and number one dropped to the ground and began feeding while number two passed on to a tree top where it remained until number one took wing and, passing it, settled on a tree top some distance ahead. Number two then flew to the ground and fed awhile. Thus, alternately feeding and doing sentinel duty, they finally disappeared to the south. They were silent while feeding and perched on trees but frequently uttered their loud characteristic croaking sound while in flight, especially while circling.

RUSTY BLACKBIRD.—"J. Claire Wood shot one bird January 25, 1891, near the River Rouge, which is the only winter record." This is correct as to a specimen secured but the birds wintered here that year and have done so a number of times since.

BLACK AND WHITE WARBLER.—"J. Claire Wood has found several nests at Grosse Pointe Farms." This should be Gratiot Township. There is no place on the above farms where this warbler would breed.

YELLOW-BREASTED CHAT.—"A. W. Davidson found a pair breeding May 29, 1898. The bird was not secured." The male was taken by Mr. E. Mummery.

GRAY-CHEEKED THRUSH.—"First taken here in 1898 by J. Claire Wood." The first specimen was secured here September 19, 1891, by Walter C. Wood. I prepared the skin. The compiler has claimed I did not know what the bird was until 1905 but this bird, properly named, was sent to Joseph Grinnell four years before the list under consideration was published.

NORTHERN PILEATED WOODPECKER.—"J. Claire Wood saw one about 1886." This bird was seen in Grosse Pointe Township, Wayne County, October 15, 1888.

My attention was recently called to a doubtful record of my own in 'The Auk' (XVII, p. 391), which reads as follows: "In June, 1899, my brother added the Black-throated Blue Warbler to the list of birds breeding here. I have never personally observed this species in summer." The facts are that my brother reported a pair in an opening in a large woods. The female exhibited all the anxiety of a breeding bird and a search was rewarded by an empty nest, apparently just built. I accompanied him to this woods the following Sunday but there were so many

openings of similar appearance he failed to locate the one desired. No warblers of this species were seen. At various times during the last seven years I have thoroughly explored this woods in summer without seeing a Black-throated Blue Warbler, and now believe my brother was mistaken; in fact, he admits the possibility. The females of this species and the Indigo Bunting are very similar in coloration and the latter are common about the openings in this woods. The record should be eliminated.—J. CLAIRE WOOD, *Detroit, Mich.*

Some Rare Summer Residents of Berks County, Pennsylvania.—All the following species have been observed by the writer, during the summer months, although nothing definite has thus far been learned about the breeding habits of a few of them.

Philohela minor. AMERICAN WOODCOCK.—This much-esteemed game bird, which, according to good authority, was a rather frequent summer resident years ago, is now a very rare breeder here. Although the writer has never been fortunate enough to find a nest containing eggs, young, in different stages of development, have on several occasions been found, which is sufficient evidence of its breeding in this locality. On May 18, 1907, the writer and a friend found four nearly full-grown young with the parent birds in a dense thicket about one mile southwest of Fleetwood, while another friend reported having seen young, in a different locality, on May 19.

Cathartes aura. TURKEY VULTURE.—The writer's first experience with the breeding habits of this species was acquired on May 15, 1904, when a nest, containing two eggs, was found near Pikeville. The eggs were laid on the bare ground under a large rock about four feet from the entrance. While on a botanical tramp in the Blue Mountains on May 5, 1907, a second nest, containing two eggs, was found on what is popularly known as "Pulpit Rock," a peak in the mountains. These eggs were deposited on dry leaves in an opening under a huge mass of solid rock. According to a resident of that locality, several pairs are yearly to be found nesting there.

Buteo platypterus. BROAD-WINGED HAWK.—The first authentic nest of this hawk, found in this locality, was discovered by a friend on May 8, 1902. It was placed on a chestnut tree about 30 feet high. The nest was evidently an old crow's nest. Subsequently a nest was found on May 25, 1903, and two on May 19, 1907, in different localities. All these nests were placed on chestnut trees ranging in height from 25 to 30 feet, and in every case two eggs were deposited and the crows were the architects of the nests. However, on May 26, 1907, a nest, containing three eggs, was found near Moselem.

Strix pratincta. BARN OWL.—A nest of this species was discovered by the writer on April 2, 1905, in the hollow trunk of a buttonwood tree about 38 feet high. The bottom of the nest was covered with meadow mice and moles in all stages of decomposition, and on these were depos-

ited two eggs. On April 11, the nest contained seven eggs, and both birds occupied the hollow. The birds left the nest when the tree was ascended about half the distance to the entrance. Judging from the existing conditions, the birds had occupied the place for many years, and a pair is rearing its young there every spring.

Empidonax virescens. GREEN-CRESTED FLYCATCHER.—A nest (in course of construction) of the Green-crested Flycatcher was found by the writer in a thicket, near Fleetwood, on June 9, 1906. On June 15 the nest was found deserted and nothing has since been learned of the breeding habits of these birds, although several pairs may be heard during the summer in the same locality.

Otocoris alpestris praticola. PRAIRIE HORNED LARK.—A pair of these birds was seen during the summer of 1906, and again on June 3, 1907, in the same locality. The species may probably prove a rare breeder here later on.

Zamelodia ludoviciana. ROSE-BREASTED GROSBEAK.—A nest of the Rose-breasted Grosbeak was found by the writer on May 28, 1905, near Fleetwood. It was placed on a small red maple about 6 feet high and contained 2 eggs and the broken remains of a third one. On June 9, 1906, a second nest, containing four about half full-grown young, was found in another locality, while on June 20 a third nest, containing three eggs, was found in the same locality. Several pairs are yearly nesting in this locality.

Helminthophila pinus. BLUE-WINGED WARBLER.—This warbler has repeatedly been seen in this locality during the summer months, but the writer has thus far not been able to learn anything about its breeding habits and would be very thankful to any reader of 'The Auk' who is familiar with these birds for any information that will better qualify him to find its treasures.

Wilsonia mitrata. HOODED WARBLER.—The first and only nest of this warbler that has ever been found in this locality, to the writer's knowledge, was discovered on June 6, 1907, in a dense thicket at the foot of the Blue Mountains. The nest was completed but contained no eggs. On visiting the same locality on June 15, the nest contained four eggs. It was placed about 18 inches from the ground and was saddled on a dead stick as well as having been partly supported by a small branch of sassafras.

Setophaga ruticilla. AMERICAN REDSTART.—The Redstart has on several occasions been observed in this county during the summer months, but its breeding habits remain to be studied by me.

Sitta canadensis. RED-BREASTED NUTHATCH.—A Red-breasted Nuthatch was seen by the writer on a steep hillside in the Blue Mountains on June 6, 1907. It is probable that the species is a rare breeder in the mountainous portion of this county.—W. H. LEIBELSPERGER, *Fleetwood, Pa.*

Rare New England Birds.—The Boston Society of Natural History has recently acquired for its New England collection, several rare or interest-

ing birds, which with the permission of the Curator, Mr. C. W. Johnson, are here recorded. These include certain species of shore birds collected by the late William Everett, of Boston, about 25 years ago, mostly at Ipswich, Mass., but a few at Nantasket, Mass., though the exact data are not recorded. These specimens were presented, at his request, shortly after his death.

Gelochelidon nilotica. GULL-BILLED TERN.—A specimen taken in March, 1885, near Portland, Maine, was purchased from Ward of Rochester.

Chaulelasmus streperus. GADWALL.—A specimen was taken December 1, 1902, at Point Judith, R. I.

Aythya collaris. RING-NECKED DUCK.—Mr. Dwight Blaney presented a female taken at Eastham, Mass., October 28, 1903.

Herodias egretta. AMERICAN EGRET.—A female taken at East Greenwich, R. I., August 16, 1904, was purchased from Messrs. Angell and Cash.

Rallus elegans. KING RAIL.—A bird, in worn plumage, was captured in a steel trap at Peabody, Mass., on March 13, 1908.

Ionornis martinica. PURPLE GALLINULE.—A male captured at Seconnet, R. I., on June 8, 1900, is in the collection.

Steganopus tricolor. WILSON'S PHALAROPE.—A specimen in fine plumage taken on the Massachusetts coast was received from the collection of the late William Everett. This seems to be the fifth recorded specimen for the State.

Actodromas bairdii. BAIRD'S SANDPIPER.—A male taken at Newburyport, Mass., September 6, 1906, was presented by Mr. John H. Hardy, Jr.

Limosa fedoa. MARBLED GODWIT.—A fine old female is in the Everett collection, from the Massachusetts coast.

Symphemia semipalmata. EASTERN WILLET.—A specimen from the Massachusetts coast was received from the Everett collection.

Tryngites subruficollis. BUFF-BREADED SANDPIPER.—One specimen from the Massachusetts coast was received from the Everett collection.

Numenius longirostris. LONG-BILLED CURLEW.—A specimen from the Massachusetts coast was received from the Everett collection.

Oxyechus vociferus. KILLDEER.—A specimen from the Massachusetts coast was received from the Everett collection.

Zenaidura macroura. MOURNING DOVE.—A specimen was taken at Barnstable, Mass., on December 6, 1903.

Falco rusticolus obsoletus. BLACK GYRFALCON.—One was recently purchased that was taken at Alton, Penobscot Co., Maine, on October 20, 1905. This is a very dark bird, almost entirely black, and with almost no light edging to the feathers of the breast; the under tail coverts are barred with white.

Strix pratricula. BARN OWL.—On August 17, 1907, a young man while hunting at Dedham Island, Dedham, Mass., started a Barn Owl from among some bushes on the edge of a meadow. He shot the bird and it proved to be a male. The Society has purchased it for the New England collection.

Scotiaptex nebulosa. GREAT GRAY OWL.—A specimen was obtained that was shot at Stockton Springs, Maine, in January, a few years since.

Cryptoglaux tengmalmi richardsoni. RICHARDSON'S OWL.—One was obtained from Milford, Maine, where it was shot on December 22, 1906.

Surnia ulula caparoch. AMERICAN HAWK OWL.—One was taken at Van Buren, Aroostook Co., Maine, on April 16, 1906.

Piranga rubra. SUMMER TANAGER.—A male, said to have been shot at Seaconnet, R. I., on April 27, 1901, was purchased of Messrs. Angell and Cash. There seems to be no reason to discredit the record.—GLOVER M. ALLEN, *Cambridge, Mass.*

Notes from West Virginia.—Sphyrapicus varius.—On July 3 and 4, 1899, I found a number of Yellow-bellied Sapsuckers in "The Pines," a black spruce region near Pickens, in the western part of Randolph County, West Virginia. The next day, July 5, great numbers of these birds were found among the dead and dying sugar maples on the top of Turkey Bone Mountain, not far from "The Pines." While in the Yew Mountains, in Nicholas County, I took a young male of this species on August 17, 1904.

Empidonax minimus.—In many of the higher portions of West Virginia there are extensive glades. These mountain swamps, with their tall cinnamon ferns, cranberries, and other characteristic plants, are found at altitudes varying from 3000 to 4000 feet. There are many such glady regions in Webster County. While collecting a few specimens in one of these Webster County glades, on the 2d day of July, 1907, I took a fine adult male Least Flycatcher. It was in the very heart of a great thicket of glade shrubbery, and had been heard there for several days before it was taken. Judging from the actions of the bird, and the greatly enlarged testes, it may have been nesting there. Others of this species were heard near the same place in the early days of July.

Otocoris alpestris praticola.—Among my notes I find the following account of the breeding of this species in Pittsburgh, Pa. "Schenley Park, Apr. 4, 1898. On above date an adult *Otocoris alpestris praticola* was observed feeding its young out near the golf links. The young bird was captured and identified, and then released. Afterwards the parent bird brought food again. Nasal tufts incipient in young bird. Hind claw already very long. Down still on head on either side where tufts of adults are. Queer horned appearance. Young hopped,—did not walk. Plumage in spotted phase. Young bird almost able to fly. Adults wary. Did not pay any attention to squeaking sound made on back of hand. Note of young like the peculiar piping note of adult. Only one young bird observed."

This southern breeding record of the Prairie Horned Lark led me to study the bird rather closely in succeeding years in West Virginia. I have observed this species in many sections of the State. In Kanawha County, at Charleston, a bird of this species was seen as late as June 19, 1902. In Wood County it seems to be resident throughout the year. At Poca Bottoms, in Putnam County, a specimen was taken on October 15, 1902,

by A. Sidney Morgan, and was carefully examined by the writer. Two were observed at Cameron, Marshall County, June 11, 1900 — evidently a pair. I have seen birds of this species in Lewis County in the breeding season. Prof. S. B. Brown, of the West Virginia University, tells me that he has seen this bird a number of times near Morgantown, and on April 2, 1905, Prof. Fred E. Brooks, Associate Entomologist of the West Virginia Agricultural Experiment Station, took a young bird just from the nest near Morgantown. To all of these records, I may add the following, which is, I believe, the most southern record of the breeding of this species. I give these notes as they came to me in a letter from Prof. Fred E. Brooks, as follows:

"French Creek, W. Va., Apr. 11, 1905. . . . Your note concerning my observation on the Horned Lark at Morgantown came here yesterday, and seems to have stirred me up, for this morning I found a nest with three young birds. Father was scattering some manure on the grass just over the hill from the corn-house, and the chickens, which were gathered about him, were attacked by two old larks. They would alight upon their backs and fight them viciously. He called to me, and after looking a minute I found the nest only a few feet away. The nest is without the slightest protection, and is made almost entirely of grass-blades and straws in a little hollow place in the ground no larger than a pint cup. The young birds will be large enough to leave the nest in five or six days. They have the white spots all over the body which you mention as being characteristic. The young one I caught at Morgantown had the same spots."

Within ten years this species seems to have extended its breeding range far southward into West Virginia.

Carpodacus purpureus.— On August 28, 1902, I found the Purple Finch abundant in "The Pines." While sitting by the road-side, a pair of these pretty birds came down to a spring and drank. One of these was a male in full "purple" plumage. These finches were flying everywhere among the black spruce trees and over the adjoining farms.

Chondestes grammacus.— About the year 1900, the Lark Sparrow first made its appearance at French Creek, in central West Virginia. Early in June of that year my attention was called to this bird by its splendid song and striking appearance. On June 20, I saw an adult Lark Sparrow with two young just a day or two from the nest. Again on July 1, two young were seen. For three or four years afterward, this species was often seen at French Creek in the breeding season, but I did not succeed in finding a nest, or in seeing the young again. I have additional records of the occurrence of this species in this State as follows:— Blue Knob, Clay County, July 30, 1900; Waverly, Wood County, almost every week in summer seasons, 1903-1906; Lewis County, one heard in song May 2, 1907. This species, like the Prairie Horned Lark, seems to be a recent emigrant into our State.

Junco hyemalis carolinensis.— For the past ten years, I have spent a week or more each summer in some part of the mountainous region of this

State. Several trips have been made into the Rich Mountains, near Pickens in Randolph County. In 1904 I was in the Yew Mountains in Webster and Nicholas Counties. In 1906 I spent several days in the Back Alleghenies, in Randolph and Pocahontas Counties. Other short trips have been made into the "Spruce Belt" and other high sections of West Virginia. While in these higher regions I have had good opportunities to study the Carolina Junco and other species found in the Canadian Life Zone. Juncos were very abundant in "The Pines," on top of Rich Mountain, in July, 1899. At this time I found many old nests in the up-turned roots of spruce trees that had blown over in recent storms. In the Yew Mountains, in August, 1904, this subspecies was found in great numbers. Several specimens taken seemed to have all the marks of *carolinensis*, while others were quite typical *hyemalis*. Specimens from the Yew Mountains were slightly smaller in all their measurements, excepting length of tarsus, than specimens from the Back Alleghenies. On August 11 a nest was found in process of construction in an old up-turned root near Hunter's Fork of Cherry River. Six days later, the nest was seen again and contained three eggs. On August 15, somewhat nearer the summit of one of the higher points in the Yew Mountains, another nest was found in the top of a small black spruce about $3\frac{1}{2}$ feet from the ground. The nest was made of moss and lined with rootlets and long hairs. It contained three fresh eggs.

The Carolina Junco is very abundant in the Back Alleghenies where I collected a number of specimens in August, 1906. The birds in this region were much nearer true *carolinensis* than those found in the mountains farther to the west. No nests were found in the Back Alleghenies.

Vireo solitarius alticola.—A young female of this subspecies was taken for me on August 15, 1904, in the Yew Mountains at an altitude of 4000 feet. Two birds were seen in a large birch tree uttering a low, scolding note. This seemed much lower and softer than the similar *kree* of the Blue-headed Vireo. On August 7 and 8, 1907, many Solitary Vireos were heard and seen in the Rich Mountains. No specimens were taken, but I am inclined to believe they were *alticola*.

Dendroica caerulescens cairnsi.—Every time I have gone into our West Virginia mountains, I have found these birds in abundance. On July 4, 1899, I saw an old male feeding a young bird up in the dark spruce forests above Pickens. As late as August 17, 1906, the young birds were following the old ones, and receiving their food from them, up in the Back Alleghenies. Many of these West Virginia birds which I have seen have no black on the back.

Dendroica maculosa.—In 1904, I spent a week in the Yew Mountains (August 10–17), and during our stay there not a single Magnolia Warbler was seen. In the Rich Mountains, however, I have observed this species very often. On July 4, 1899, I saw a young bird following two adults.

So late in the season as August 18, in 1906, while out in the black spruce woods near Cheat Bridge, I saw an adult Magnolia Warbler feeding her

young that had just left the nest. On the same day a young bird of this species was taken for me by Prof. W. E. Rumsey.

On a long mountain ridge that lies between Big Sugar Creek and Little Sugar Creek, at the head-waters of Elk River, I found the *Magnolia Warbler* to be one of the most abundant species on the 14th of August, 1899.

***Dendroica cerulea*.**—Wonderfully abundant in Wood County on the hills just back from the Ohio River. Breeds in the open oak woods on top of the hills.

***Dendroica pensylvanica*.**—A nest of the Chestnut-sided Warbler was found in the glades of Webster County on July 2, 1907. It was neatly placed in the top of a clammy azalea, about 8 feet from the ground. The azalea was in full bloom. There were two young birds in the nest. Many other birds were seen, and all were evidently nesting.—EARLE A. BROOKS, *Weston, West Virginia*.

RECENT LITERATURE.

Rothschild's 'Extinct Birds.'¹—Mr. Rothschild, as is well known, has been for years actively interested in the subject of vanishing birds, and we expected to find in the present expensive work a complete and final account of the species now known to be extinct, but in this we are disappointed. As stated on the title page, this is "an attempt to unite in one volume a short account of those birds which have become extinct in historical times—that is, within the last six or seven hundred years," which means that the author has included in his work the numerous fossil birds of the New Zealand and Mascarene regions. As a matter of fact, the accounts of fossil birds (*i. e.*, those known only from their osseous remains), overbalance those of the recently extinct ones, since some 90 of the former are treated, compared with 76 of the latter, while over 50 pages of the book are perfectly blank.

Of the fossil birds we shall have little to say here. It may be mentioned, however, that colored figures are given of *Megalapteryx huttoni* and *Dinornis ingens*, representing them as they are supposed to have existed in life. If correctly delineated, the *Megalapteryx* must have been a very extra-

¹ Extinct Birds. | An attempt to unite in one volume a short account of | those Birds which have become extinct in historical | times—that is, within the last six or seven | hundred years. To which are | added a few which still | exist, but are on | the verge of | extinction. | By | The Hon. Walter Rothschild, | Ph. D., F. Z. S. | With 45 coloured Plates, embracing 63 subjects, and | other illustrations. | London. | Hutchinson & Co., Paternoster Row, E. C. | 1907—Small folio, pp. i-xxix + 1-244, 45 colored plates, and 4 plates of outlines.

ordinary creature, since it is supposed to have possessed a 'booted' tarsus, a feature we believe to be unique (not to say unnatural) among flightless birds, whose tarsi are covered with a strong armor of scales. The feathered tarsus is not an innovation of the artist's, for as Mr. Rothschild says, "Professor Owen has shown that *Megalapteryx huttoni* was feathered down to the toes, and in the plate I have represented it clothed with feathers" (p. 186). The nomenclature of fossil forms is up-to-date, and the author evidently has been to much pains in revising the various genera and species of Dinornithidae. We note that *Cela* Reichenbach, is recognized as a genus containing five species, but would call attention to the earlier use of this name by Oken (1816).

Mr. Rothschild's book will serve to call attention to the many birds already extinct, and to the still larger number now threatened with extinction, although the list there given by no means includes all of the species in these categories. We find no mention of the Eskimo Curlew, the 'Cahow' of Bermuda, the several Guadalupe Island birds now extinct or nearly so; nor do we find many of the Polynesian species that might well be included among those threatened with extinction.

Among the colored plates are 20 or more, based entirely upon descriptions (no specimens having been preserved) or illustrations of the old writers, and some of these do not appear to be entirely trustworthy. Thus, in the plate of *Ara erythrura*, we find the tail prominently tipped with blue, while in the text it is described as "entirely red." It is not improbable, too, that some of the Macaws ascribed to the West Indies, such as *Anodorhynchus purpurascens*, were originally described from cage birds brought from the continent. The plate of *Ara tricolor*, based on the Liverpool Museum example, if a faithful reproduction of that specimen, may prove to be some other species (it is to be remembered that we know nothing of the colors of the species which formerly lived in Hayti), since it lacks the strong yellow color on the back of the neck, as well as the yellow markings on the sides of the body, and yellow edgings to the red feathers on the mantle. In the account of this species the author enumerates five specimens known to him, "two in the British Museum, one in Paris, one in Leyden, one in Liverpool." To this list we can easily add six more: two in Washington, one in Boston, and three in Cuba, while Gundlach probably sent others to Germany. Had the author addressed inquiries to the various museums at home and abroad, his census of specimens in this and many other species would have been more nearly complete.

Notornis alba of White (or Shaw), is accredited to Norfolk Island, while *N. stanleyi* is given as the species from Lord Howe's Island, but it seems probable that *N. alba* is the one from the last-named locality. White's account (not given by Rothschild) is as follows: "They also found on it [Lord Howe's Island, at that time newly discovered] in great plenty, a kind of fowl, resembling much the Guinea fowl in shape and size, but widely different in colour; they being in general all white, with a red fleshy substance rising like a cock's comb, from the head, and not unlike a piece of

sealing-wax. These not being birds of flight, nor in the least wild, the sailors availing themselves of their gentleness and inability to take wing from their pursuits, easily struck them down with sticks." (White, Journ. Voy. N. S. W., 1790, p. 135). In our estimation, a reproduction of the old accounts of many of these extinct birds would have greatly enhanced the value and usefulness of the book.

Strigiceps leucopogon Lesson, is introduced on page 30, but its identification is still uncertain. The type was probably in the collection of Dr. Abeillé, of Bordeaux, but in any event, if one could only consult the collection of colored drawings at one time in Lesson's possession (cf. P. Z. S., 1855, 212), its determination would probably be quite simple.¹

The following species are described and named as new: *Casuarius lydekkeri* (p. x), *Ara erythrura* (p. 54), *Necropsittacus* (?) *borbonicus* (p. 62), *Bubo* (?) *leguati* (p. 71), *Strix newtoni* (p. 79), *Ardea duboisi* (p. 114), *Nesænas duboisi* (p. 166), *Megalapteryx hamiltoni* (p. 197), *Emeus boothi* (p. 210), *E. haasti* (p. 210), *E. parkeri* (p. 211), and *Dromaius peroni* (p. 235), the last being a new name for the Kangaroo Island Emu, currently known under Vieillot's specific name *ater*, but, as Mr. Rothschild here shows, the latter was originally proposed by Vieillot to replace Latham's *Casuarius novæ hollandiæ*. Several nominal species proposed by Forbes are here first given a definite status, viz.: *Palæocasuarus* (p. 219), *P. haasti* (p. 220), *P. velox* (p. 220), and *P. elegans* (p. 220). "*Foudia newtoni*," mentioned on p. xi, seems to be a new name for *F. flavicans*, but if so, is a *nomen nudum*.—C. W. R

Dearborn on a Collection of Guatemalan Birés.²—The birds recorded in this catalogue were collected between the winter of 1904 and the early part of 1906, a small proportion by Messrs. Edmund Heller and C. M. Barber, but the greater part of them, no less than 1000, by the author of the paper, during the latter part of the period. In all, 1187 specimens, mostly skins, constitute the collection, and these represent the large number of 305 species and subspecies.

The identifications have apparently been made with care and there are many interesting notes on geographical and other variations. Three new forms are described,—*Saucerottea cyanura guatemalæ*, *Diglossa montana* and *Regulus satrapa clarus*, and the range of *Terenotriccus erythrurus fulvigula* is extended considerably northward. A remarkable female Rose-

¹ Abeillé's collection was an important one, containing about 1500 specimens, including nearly one hundred of Lesson's types (described chiefly in the 'Écho du Monde Savant'). It was probably sold, after Abeillé's death, since a little pamphlet ('Catalogue des Oiseaux composant la Collection de feu le Dr. Abeillé, de Bordeaux,' 44 pp.) was published in 1850, giving a list of the specimens in it. On p. 15, we find Abeillé had one specimen of *Strigiceps leucopogon*. Here the locality is stated to be "Himalaya."

² Catalogue of a Collection of Birds from Guatemala. By Ned Dearborn, Assistant Curator of Ornithology. Field Museum of Natural History, Publication 125, Ornithological Series, Vol. I, No. 3, pp. 69-138, pls. i-iii (maps). November, 1907.

breasted Grosbeak is described as having its under wing coverts and a suffusion on its throat geranium pink, otherwise normal in plumage.

The nomenclature of the latest authorities, such as Ridgway, Sharpe and the A. O. U. Committee, is used and the many changes recently shown to be necessary are adopted. Unfortunately, however, seven or eight slight errors, such as misspellings and wrong gender endings, have crept in.

A map giving the points at which collections were made serves as the frontispiece. Two other maps show the ranges of the races of *Calocitta formosa* and *Planesticus tristis*, and a half-tone illustrates the breast and trachea of the male *Ortalis vetula plumbeiceps*.

The value of the list is enhanced by many careful notes by the author on the coloring of the changeable portions of the birds collected, such as iris, bill, feet and naked skin. There are also frequent remarks on moult and on the habits of the birds observed.

Mr. Dearborn's paper is a painstaking piece of work and adds much of interest and value to our knowledge of Guatemalan birds.—W. De W. M.

Shaw's 'The China or Denny Pheasant in Oregon.'¹—The Chinese or Denny Pheasant (*Phasianus torquatus*) was introduced into Oregon by the late Judge O. N. Denny, at one time Consul-General to Shanghai, "after whom the legislature of Oregon has since called the bird the Denny Pheasant." The story of its successful introduction and subsequent increase and dispersion is here told in considerable detail, but, strangely, exact dates are omitted. From the context, its introduction was apparently made in the early '80's. The first shipment was unsuccessful, few of the seventy birds in the consignment reaching their destination alive, and these soon died from injuries received in transit. The following year a shipment of thirty birds was made, all but four of which reached Portland alive and in good health, and a few days later were turned out on the large ranch of Judge Denny's brother, John Denny, in Linn County, in the Willamette Valley. "About two years later," Judge Denny made another shipment of ninety birds, "chiefly pheasants and partridges . . . in which the ring-necked was not a predominating factor." Those now sent were largely "silver and copper pheasants," which were transferred to a club and turned loose on Protection Island, in the Columbia River, and "many flocks of silver pheasants now west of the Cascades trace their ancestry to this island in the Columbia."

This account, less explicit as to dates than is desirable, is followed by an informal notice of the native grouse of the Northwest, and of the habits

¹ The China or Denny Pheasant in Oregon | with notes on the | Native Grouse of the Pacific Northwest | Written and illustrated | by | William T. Shaw, B. Agr., M. S. | Assistant Professor of Zoology and Curator of the Museum, State College of Washington | [seal] Philadelphia & London | J. B. Lippincott Company | 1908 — Oblong, 6½ × 9½, pp. 24, pll. 14, and colored frontispiece; text and plates on heavy plate paper. Price, \$1.50.

of the introduced Ring-necked Pheasant, in which it is stated that hybrids between this species and the Sooty Grouse are of frequent occurrence. An attempt to domesticate the pheasants, it is said, has met with an encouraging degree of success.

The illustrations of this beautifully printed brochure include a colored plate of the male 'China Pheasant,' and the following half-tone plates: Peterson's Butte, where the pheasants were first liberated; a female 'China Pheasant'; its nest, full of eggs, and the same nest, with the egg shells after hatching; pheasant chicks; a view in the Willamette Valley, the home of the pheasants; a male Sooty Grouse; a hybrid — 'China Pheasant' + Sooty Grouse; then, on succeeding plates, a Willow Grouse, a Sage Grouse (male), Columbia Sharp-tailed Grouse (female), Oregon Ruffed Grouse, Mountain Partridge, and Valley Partridge. All are from mounted birds but from excellent specimens, and with good back-ground effects.— J. A. A.

Giglioli's 'Avifauna Italica.'— As indicated by the full title,¹ this volume of more than 800 pages is a catalogue of the birds known to occur in Italy, numbering 496 species, with their local vernacular names, a statement of their manner of occurrence and distribution in Italy, and a critical examination of their local variations. Italian birds appear to possess an unrivalled number of vernacular designations, the enumeration of which, for the commoner species, forms a large part of the text of the present work.² There is no technical synonymy, and the species are not described; the extended annotations relate wholly to their distribution and manner of occurrence, with mention of their various subspecies, as recognized by modern authors, and in general their condemnation as puerile innovations. In other matters of nomenclature the author is also extremely conservative; tautonymic designations and trinomials are to him an abomination. His nomenclature is strictly binomial, and the forms recognized by him are all full species. He has, indeed, only unsympathetic words for these modern innovations (see especially pp. xiii-xviii of the Introduction, and elsewhere *passim*).— J. A. A.

¹ Ministero di Agricoltura, Industria e Commercio | — | Direzione generale dell' Agricoltura | — | Ufficio Ornitologico | — | Secondo Resoconto | dei risultati della inchiesta ornitologica in Italia | — | Avifauna Italica | nuovo elenco sistematico delle specie di uccelli | stazionarie, di passaggio o di accidentale comparsa in Italia; | coi nomi volgari, colla loro distribuzione geografica, | con notizie intorno alla loro biologia, ed 'un esame critico delle variazioni | e delli cosiddette sottospecie | compilato dal dottore | Enrico Hillyer Giglioli | Professore ordinario di Zoologia e Anatomia dei Vertebrati | nel R. Istituto di Studi Superiori in Firenze, Membro del Comitato ornitologico internazionale | e Direttore dell' Ufficio ornitologico | [Seal] Firenze | Coi Tipi dello Stab. Tipografico S. Guiseppe | 1907 — 8vo, pp. XXIV + 784. Lire 10.

² The Index to the vernacular names occupies 70 pages of small type, of three columns to the page!

Bonhote's 'Birds of Britain.'¹—This book gives colored illustrations of 108 species of British birds, forming 100 plates, reproduced, generally satisfactorily, from Mr. Keuleman's originals, selected for this work by H. E. Dresser from the illustrations of his well-known 'Birds of Europe.' The author tells us that the work includes "every species which has been known to occur in Great Britain, with a description of their leading characteristics and true habitat . . . ; and the plates have been carefully selected so as to give examples of the most typical species." The "notes on their ways and habits," we are also informed, have "been taken at first hand straight from Nature." The biographies are for the most part pleasantly written, and though generally short, serve, with the colored plates, to make an attractive book for the general reader interested in British birds.—J. A. A.

'British Birds.'²—'British Birds'² is the name of a new illustrated monthly magazine devoted entirely to the study of the birds of the British Isles. The first number bears date June 1, 1907, and it has already shown abundant *raison d'être*. It is edited by H. F. Witherby, assisted by W. P. Pycraft, and evidently has the earnest support of many of the leading British ornithologists. "It shall be one of our chief aims," say the editors, "but not by any means our only aim, to provide in these pages, month by month, a current history of British birds. Much will come, we trust, by first-hand contributions, but we shall also glean, from every published source available, whatever is likely to prove of permanent value. . . . Besides reviews and notices of books dealing with British birds, we intend to publish each month a list as complete as possible of all the books on the subject which have appeared during the month."

The opening article of the first number is a paper by the late Howard Saunders on 'Additions to the List of British Birds since 1899,' or since the appearance of the second edition of this author's 'Illustrated Manual of British Birds,' since which date "twenty additional species have established more or less claim to inclusion." The records are given in detail for each. "A Study of the Home Life of the Osprey," by P. H. Bahr, is based on the observations of a colony, in July, 1903, "on an island not a hundred miles from New York City," and is illustrated with several half-tone plates and text cuts. The first number also contains a paper by P. L. Selater 'On a supposed new British Tit of the genus *Parus*,' *P. atricristatus kleinschmidti* (Hellm.) Hartert, in which he suggests that further explanations are desirable respecting its real status. These are furnished

¹ Birds of Britain | By | J. Lewis Bonhote | M. A., F. L. S., F. Z. S. | Member of the British Ornithologists' Union | With | 100 Illustrations in Colour | selected by | H. E. Dresser | from his 'Birds of Europe' | [Monogram] London | Adam and Charles Black | 1907 — 8vo, pp. i-xii + 1-405, 100 col. pll. Price, 20s. (post free, 20/6).

² British Birds, an Illustrated Magazine devoted to the Birds on the British List. 326 High Holborn, London: Witherby & Co.—8vo, about 32 pp. to the number, with half-tone plates and text illustrations. Monthly. Price one shilling net.

by Dr. Hartert in a later number (No. 7, December, pp. 208-222) in a paper entitled 'On Birds represented in the British Isles by peculiar forms,' twenty-two in number, the history and the characters of each of which are presented.

There are also continued papers running through several numbers each, as 'Nesting Habits observed abroad of some Rare British Birds,' by F. C. Selous; 'On the More Important Additions to our Knowledge of British Birds since 1899,' by H. F. Witherby and N. F. Ticehurst; 'Nesting Birds and Some of the Problems they present,' by W. P. Pyecraft; 'Wind and Flight,' by F. W. Headley, etc. Each number contains also several pages of 'Notes,' and a number of reviews of new books and papers. There are also memoirs of Professor Alfred Newton, by Dr. Sharpe, and of Howard Saunders, by Abel Chapman, each with a portrait.

As shown by the foregoing, there was evidently a field for a magazine like 'British Birds,' and, furthermore, that the field is now excellently filled by this new Journal.—J. A. A.

Godman's Monograph of the Petrels.¹—Part I of this beautiful monograph treats of 24 species, of which 20 are figured, belonging to the genera *Procellaria*, *Halocyptena*, *Oceanodroma*, *Garodia*, *Pelagodroma*, *Pealea*, and *Cymodroma*. The synonymy and bibliographical references are followed by a Latin diagnosis, a fairly full biography, and by an account of the various plumages of the species. The subject seems to be brought well up to date, both as to the technical and biographical details.

It may be noted that *Oceanodroma socorroensis* Townsend, 1890, is referred to *O. monorhis* Swinhoe, 1867, and that *O. monorhis chapmani* Berlepsch, 1906, is not considered as separable from *O. monorhis* after an examination of the types, kindly submitted to the author of the 'Monograph' for study. On p. 9, *O. beldingi* is evidently a lapsus for *O. beali*.

This useful work is a most welcome and important contribution to the literature of these little-known birds. As we have already announced (*antea*, p. 105), the 'Monograph' is to be issued in five quarterly parts, and will contain over 100 hand-colored plates.—J. A. A.

Mathews's 'Handlist of the Birds of Australasia.'²—This is stated by the author to be preliminary to his proposed work 'The Coloured Figures

¹ A | Monograph | of the | Petrels | (order Tubinares) | By F. Du Cane Godman | D. C. L. F. R. S. President of the British | Ornithologists' Union etc, etc. | With hand-coloured Plates | by J. G. Keulemans | In Five Parts | Part I. | Witherby & Co. | 326 High Holborn London | December 1907 — Large roy. 4to, pp. 1-68, pll. i-v, va, vi-xix. Subscription price, £2 5s. per part.

² Handlist | of the | Birds of Australia | By Gregory M. Mathews | F. L. S., F. Z. S., M. B. O. U., &c. | With an Introductory Letter | by R. Bowdler Sharpe, LL. D. | Assistant Keeper, Department of Zoology, British Museum. | Melbourne: | Walker, May & Co., Printers, Mackillop Street | (off 390 Little Collins Street) | 1908.—Supplement to 'The Emu,' Vol. VII, January, 1908, pp.1-108.

of the Birds of Australasia,' which is to be "a set of hand-coloured plates of the birds of Australasia, drawn by Mr. J. G. Keulemans." The 'Handlist' is founded upon Dr. Sharpe's 'Handlist of Birds,' and is put forth "to invoke criticism and coöperation of ornithologists, in order to enhance the value of the larger undertaking." The 'Handlist' will, however, be in itself a great convenience. It follows the arrangement and nomenclature of Sharpe's well-known 'Handlist,' and comprises 883 species, arranged in 345 genera.—J. A. A.

Marshall on the Anatomy of *Geococcyx*, *Bubo*, and *Aeronautes*.¹—Miss Marshall here follows her former paper on the anatomy of *Phalaenoptilus* (see Auk, XXIII, 1906, p. 237) by a paper descriptive of the alimentary tract, the central nervous system, the nostrils and eye, the urogenital system, and the muscles of the fore limb, in *Geococcyx*, *Bubo*, and *Aeronautes*, and the pterylosis of *Geococcyx*, with illustrations.

The comparisons are limited mainly to the five genera here named. There appear to be no references to the previous literature of the subject, beyond a short list of titles, with the vaguest references to place of publication possible, as 'Ibis,' 'Auk,' 'Proc. Zool. Soc. London,' etc. (see *antea*, p. 92). As a contribution, however, to descriptive anatomy the paper has value, as it is very fully illustrated.—J. A. A.

Shufeldt on the Osteology of *Sarcops*.²—The skeleton of *Sarcops calvus* is here described and figured, and compared with that of several other genera, as *Oriolus*, various genera of Icteridæ, Corvidæ, etc., without, however, reaching a definite conclusion as to its nearest relationships.—J. A. A.

McAtee's 'Food Habits of the Grosbeaks.'³—The Grosbeaks here considered are the Cardinal, Gray (*Pyrrhula sinuata*), Rose-breasted, Black-headed, and Blue Grosbeaks. Each is illustrated in colors, from drawings by Fuertes, and numerous text figures illustrate their food, vegetable as well as insect. The account of the food habits of these five species is detailed and comprehensive, and is based on the careful study of the stomach contents of a large number of individuals. These birds attack crops to a slight extent, some of the species preferring fruit, others grain, but all are

¹ Studies on Avian Anatomy.—II. *Geococcyx*, *Bubo* and *Aeronautes*. Margaret E. Marshall, M. A. Contributions from the Zoölogical Laboratory of The University of Texas, No. 73. Trans. Texas Acad. of Science, Vol. IX, 1906, pp. 19–40, pll. i–vii.

² Osteological and other notes on *Sarcops calvus* of the Philippines. By R. W. Shufeldt. Philippine Journ. Sci., Vol. II, No. 5, Oct. 1907, pp. 257–267, with 1 plate.

³ Food Habits of the Grosbeaks. By W. L. McAtee, Assistant Biological Survey, Bureau of Biological Survey, Bulletin No. 32. Washington, Government Printing Office, 1908. 8vo, pp. 92, 4 pll. (3 colored), and 40 text fig.

large destroyers of weed seeds and noxious insects, some of them 'specializing' on some of the greatest insect pests, as the cucumber beetles, borers and curculios of various kinds, Colorado potato beetles, cotton boll weevil, cankerworm, army worm, and other destructive caterpillars, etc. The conclusion is reached that these birds are many times more beneficial than destructive, and are hence of great economic value.—J. A. A.

The Work of the Biological Survey.—The act making appropriation for the Department of Agriculture for the fiscal year ending June 30, 1908, directed the Secretary of Agriculture "to investigate and report to the next session of Congress to what extent, if any, the work now being done by the Bureau of Biological Survey is duplicated by any other Department of the Government, and to what extent the work of this Bureau is of practical value to the agricultural interests of the country." The Secretary's Report¹ forms a document of some forty pages, illustrated with appropriate maps, reviewing in detail the work of the Survey. He says: "I have the honor to report that no part of the work now being done by the Bureau of Biological Survey is duplicated by any other Department of the Government, and that the work of the Survey is of great practical value to the agricultural interests of the country." Following this statement is a concise summary of "the objects, nature, and results of the investigations carried on by the Biological Survey," occupying about three pages, which is in turn followed by a classified, detailed statement of the practical work of the Survey, occupying the rest of the Report.

During the last session of Congress a bitter attack was made upon the Survey, obviously inspired by political animus, which led to a popular uprising throughout the country in its defense, which ultimately overwhelmed its maligners. The demand upon the Secretary of Agriculture for a report to Congress upon the work of the Survey was one of the fortunate results of a seemingly untoward incident; for while the country at large was keenly alive to its economic importance, many of the law-makers of the nation were in blissful ignorance of its rôle in behalf of the public welfare. Now, however, there is no longer excuse for any such ignorance. Readers of 'The Auk,' and naturalists the country over, while well aware that the small sum annually expended in the niggardly maintenance of the Survey was many times repaid through its practical results, have now access to a comprehensive and convenient statement of its varied, far-reaching, and highly beneficial activities. It is impossible, nor is it necessary, to recapitulate here its various lines of work and their economic results, so fully unfolded in this official report, which fittingly concludes with a list of the publications of the Survey, from 1885,

¹ Report on Work of Biological Survey. By James Wilson, Secretary of Agriculture. Senate Document No. 132, 60th Congress, 1st Session. Read December 21, 1907; referred to the Committee on Agriculture and Forestry and ordered to be printed, with illustrations. 8vo. pp. 39, pll. i-vi (maps).

when the work was begun, to date. These include 'Bulletins' (Nos. 1-31), 'North American Fauna' (Nos. 1-26, excepting No. 6, not yet issued), 'Circulars' (Nos. 1-62), 'Farmers' Bulletins' (10 in number), and reprints of articles from the 'Yearbook' (29 in number).

A more popular review of the work of the Biological Survey has also recently appeared in the 'National Geographic Magazine,'¹ where Mr. H. W. Henshaw attractively presents the results and methods of its various lines of research. Especial reference is made to the relation of birds to agriculture, and the investigation made accurately to determine them; also the losses due to small mammal pests and to wolves; bird reservations and game refuges; protection of game and birds; supervision against the importation of undesirable and dangerous mammals and birds. No one can fail, on reading either of these documents, to realize, at least in some degree, the great economic importance to the entire nation of the work of the Biological Survey.—J. A. A.

CORRESPONDENCE.

The Buffel-head Duck.

EDITORS OF 'THE AUK':—

Dear Sirs:—In the current descriptions of the colors of the adult male Buffel-head Duck, there is, according to my own examination of specimens, an error as to the color of his belly. Audubon, Chapman, Saunders, Hoffman and Mrs. Bailey all *include this part* with the neck, breast and wing-coverts, simply stating that all these are *white*. Wilson, alone, always so exquisitely accurate in description, says: "...rest of the scapulars, lateral band along the wing, and whole breast, snowy white; belly, vent and tail-coverts *dark* white" (the italics are mine).

This, as I have said above, agrees with my own examination of a small number of specimens procured in the New York market in winter, except that in my specimens the "*dark* white" of the belly does not include the *vent*, or *adjacent tail-coverts*, both of these tracts being pure white, or very near it. In mine, too, the "*dark* white" is too dark to be called any kind of white. It is a delicate real pattern of wood ash color, strongest along the sides and between the legs.

Yours very truly,

ABBOTT H. THAYER.

Monadnock, N. H.,
Jan. 28, 1908.

¹ The Policemen of the Air. By Henry Wetherbee Henshaw. National Geographic Magazine, Vol. XIX, No. 2, February, 1908, pp. 79-118, with 16 full-page half-tone illustrations and many others in the text.

NOTES AND NEWS.

DR. RUDOLPH BLASIUS, a Corresponding Fellow of the American Ornithologists' Union, died at his home in Braunschweig, Germany, September 21, 1907, in the 65th year of his age. He was born at Braunschweig, November 25, 1842, and was the eldest son of Johann Heinrich Blasius, the well-known author of the 'Fauna der Wirbelthiere Deutschlands' (1857), a leading authority on European ornithology, and Professor of Zoölogy in the Collegium Carolinum, the Technical High School of Braunschweig. Rudolf here received his preliminary education, and subsequently took his degree of M. D. at the University of Göttingen, in 1866. He entered the army as Assistant Surgeon in the war of 1866, and later, during the Franco-Prussian war, was promoted to Surgeon-Major. In 1879 he became Professor of Hygiene and Bacteriology in the Technical High School of his native city, which position he occupied till his death; and he also filled important offices in the municipal government.

He is said to have inherited a strong love for natural history pursuits from both his father and grandfather, and by the former was early trained in zoölogical research. Despite his many pressing duties later in life, he was able to continue active work in ornithology. He was for many years president of the Permanent International Ornithological Committee, and of the Deutsche Ornithologische Gesellschaft, and was one of the editors of 'Ornis.' He travelled much on the continent of Europe, being often a delegate to medical and ornithological Congresses, and thus became well acquainted with the ornithologists and the ornithological collections of the principal cities of Europe. His ornithological papers were quite numerous, relating mainly to the European ornithology; his earliest paper, published in 1862, being on the birds of Braunschweig, while his doctoral thesis (1866) was upon the structure of egg-shells. He was especially interested in bird migration, to which many of his papers relate.

He was a man of robust health until overtaken by his last illness, fond of field sports, a genial companion, and in his numerous travels made many lasting friendships.

MR. ROBERT RIDGWAY has recently started for a second visit to Costa Rica, where he expects to spend six months or more in ornithological explorations for the U. S. National Museum. As on his previous trip to that country, he will be the guest of his old friend, Sr. José C. Zeledon, who has done so much to develop the ornithology of Costa Rica. Leaving Washington January 27, Mr. Ridgway went via Tampa to Havana, where he met Mr. Zeledon, and the two proceeded to San José, arriving on the 8th of February. Two days later Mr. Ridgway wrote that he and Sr. Anastasio Alfaro, the genial and talented Director of the Museo Nacional, who accompanied him on several of his expeditions in 1905, were about to start on an excursion to Mount Turubales, on the Pacific slope, a peak

not hitherto visited by ornithologists. On later excursions they expect to visit the high grassy tableland in the central part of the country, and other little known regions.

The primary object of Mr. Ridgway's expedition is the collection of material for his 'Birds of North and Middle America,' the next volume of which will contain, among other families, the Formicariidæ, Dendrocolaptidæ, Furnariidæ, and Trochilidæ, of which a very large percentage of the Central American species occur in Costa Rica.—C. W. R.

ON February 28, C. William Beebe, Curator of Birds in the New York Zoölogical Society, and Mrs. Beebe, sailed on the steamship 'Korona' for Georgetown, British Guiana, for a trip to the headwaters of the Essequibo River, to study tropical bird life and obtain material for publication.

MR. FRANK M. CHAPMAN, Curator of Birds in the American Museum of Natural History, is visiting extreme southern Florida in quest of material for additional bird groups for the Museum, in which he has recently been promoted from Associate Curator to Curator.

A MANUAL of 'The Birds of Maine,' by Ora W. Knight, is announced for early publication. This work, which is devoted exclusively to Maine birds, will give "their relative abundance in each county," with descriptions of the different plumages of each species, and full accounts of their home life. Subscriptions, prior to April 15, 1908, will be \$3.00, and may be addressed to the author, 84 Forest Avenue, Bangor, Maine. Price, after this date, \$3.50.

AN "essay competition on comparative legislation for the protection of birds" has been inaugurated by the Royal Society for the Protection of Birds (London), which has issued a circular stating the regulations for the International competition for 1908. The Society's gold medal and 20 guineas are offered for the best essay or treatise on this subject. The essays, which may be written in either English, French, or German, should be sent to the Hon. Secretary, Frank E. Lemon, 3 Hanover Square, London, W., not later than December 31, 1908. Full particulars respecting the requirements of the competition may be obtained from the Hon. Secretary.

WITHERBY & Co., 326 High Holborn, London, announce 'The Vertebrate Fauna of North Wales,' by H. E. Forrest. This is one of the zoölogically most interesting, but hitherto neglected, parts of the British Islands. The work will form a large octavo volume of over 500 pages, with a colored map, portraits, plates depicting haunts, etc. It will be issued to subscribers at 12s. 6d. until the list reaches 500, when the price will be increased.

The same firm will also publish shortly an account, by M. J. Nicoll, of

three long voyages on the Earl of Crawford's yacht 'Valhalla.' The author, a well-known ornithologist, describes the bird and animal life of many islands seldom or never before explored. The book will be fully illustrated from photographs of life and scenery.

THE eighteenth annual meeting of the Delaware Valley Ornithological Club was held at the Academy of Natural Sciences at Philadelphia, January 2, 1908. The Club was never in a more flourishing condition; the membership consists of 17 Active, 68 Associate, and 37 Corresponding Members, while the 'Migration Corps' numbers 63 observers.

The officers for the ensuing year are: Wm. A. Shryoch, President; Stewardson Brown, Vice-President; Samuel Wright, Treasurer; and Chreswell J. Hunt, 225 N. 53rd St., Philadelphia, Secretary. Thos. D. Keim, 205 Radcliffe St., Bristol, Pa., is in charge of the migration work.

THE Academy of Natural Sciences of Philadelphia has just secured the Van de Pol Collection of East Indian birds, comprising about 1100 skins, from Java, Bangka, Batu Islands, Ternate, and the west coast of Sumatra. These, together with the specimens in the Tristram collection, and the Harrison and Hiller Sumatra collection, and the Porter collection from Luzon, received during the past few years, make the Academy's representation from this general region remarkably complete.

ERRATUM.—By an unfortunate lapsus, the 'erratum' on page 35 of this volume makes 'confusion worse confounded'! In Volume XXIV, plate xviii, fig. 1, accompanying Mr. A. C. Bent's paper on the 'Summer Birds of Southwestern Saskatchewan,' is wrongly indicated as 'Nests of Western Grebe'; the proper designation is 'Nests of California Gull.' The error, it is needless to say, is not the fault of the author, either on the plate or in the former erratum, but arose from a peculiar combination of circumstances, for which the editor is mainly responsible.

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(Continued on 3rd page of Cover.)

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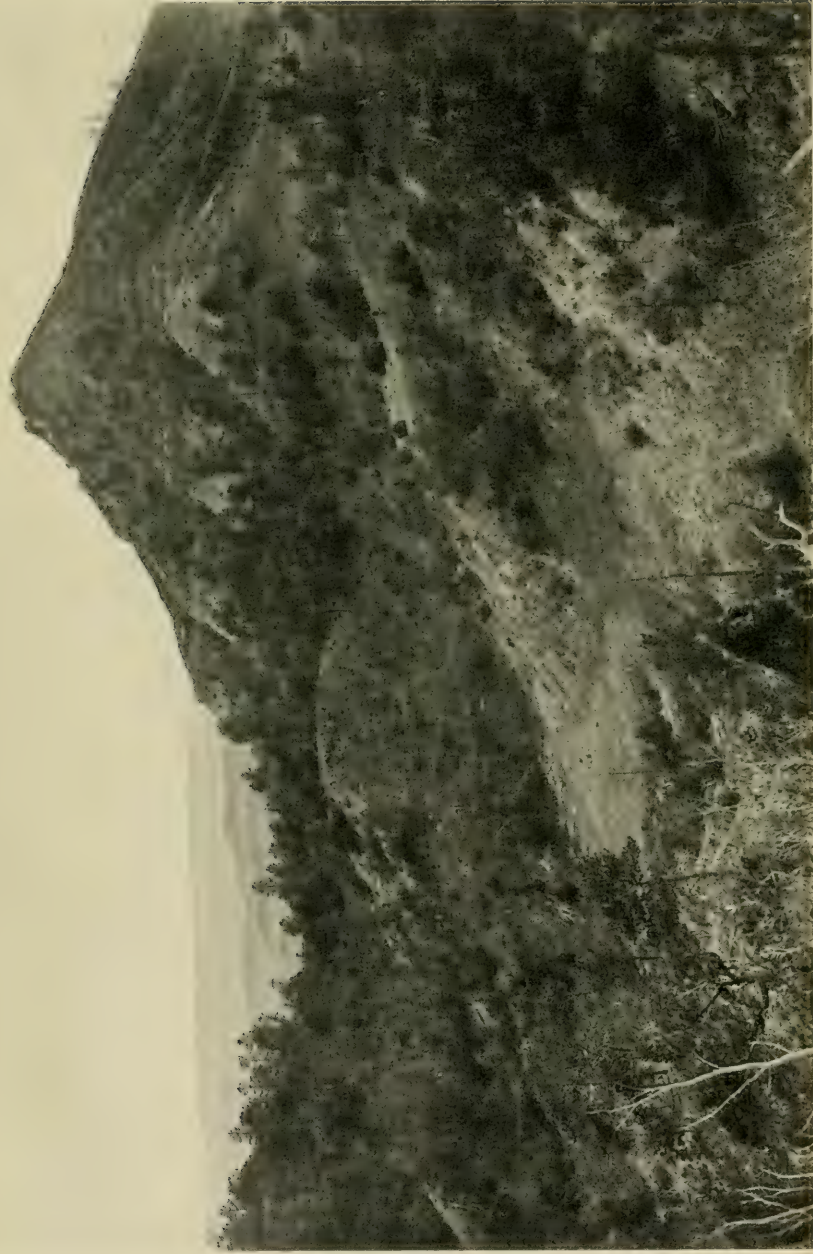
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PINE HILLS AT KNOWLTON, MONTANA, WHERE GOLDEN EAGLES NEST.

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No. 3.

OBSERVATIONS ON THE GOLDEN EAGLE IN MONTANA.

BY E. S. CAMERON.

Plates I-IV.

FROM January to September in 1907, I lived about a mile and a half from the eyrie of the Golden Eagles (*Aquila chrysaetos*) which have nested on Mr. J. H. Price's ranch at Knowlton for seven years. I saw one or other of the splendid birds almost daily, and it was interesting for me to compare their habits with those of the eagles nesting near my ranch in Dawson County of which I have already written a full description.¹ In contradistinction to the latter (which occupied a ledge of rock) these Knowlton eagles have selected a tall pine about half way up a steep hillside, the largest tree in the grove. This hill forms one of a wild pine-clad range facing east and approached across open prairie from that side. It is possible, however, to ride up through timber and rocks behind, and look down into the nest from the hilltop without alarming the eagles. All that takes place therein is plainly visible through powerful binoculars. The Eagles have become so familiarized with the sight of large droves of horses and attendant riders, as to take scarcely any notice of a horseman. On this account many actions can be observed, such as the capture of prey, its conveyance to the nest, and feeding the eaglets, which the more shy badland birds never allowed me to witness. The eyrie, which

¹ See Auk, Vol. XXII, 1905, pp. 158-167.

consists of an immense pile of pine sticks, rests upon, and is built around, a number of green boughs, while a dead projecting branch near the center forms a convenient perch for the parent eagles. As would naturally be expected in the present case, the vertical height of the nest greatly exceeds the diameter, and its width is much inferior to the nest upon the rock previously described. Nevertheless, as seen from below, it conveys an impression of strength, which is not belied when it is reached, for a six foot man can sit in it with ease. On May 11, the whole external circumference of the nest rim was interwoven with an ornamental binding of green pine tops.

This pair of eagles are of course fully adult, and both have unvaried dark brown tails. The female resembles the male of the Fallon eagles across the Yellowstone and would appear to be a uniform chocolate brown but for a few white scapulars, and some white splashes on the greater wing coverts. The male is similarly flecked with white, but a distinct ferruginous cast overspreads his plumage. As early as February 25, the male eagle was observed to tumble in the air. I first witnessed this remarkable evolution on March 14, 1904, but have observed it several times since. To the best of my knowledge no previous writer has alluded to this habit of the Golden Eagles although it is common to both sexes in the breeding season. It recalls at once the spring tumbling of the male Marsh Hawk (*Circus hudsonius*) which is even more extraordinary from the fact that the hawk turns somersaults in the air. On March 12, 1905, I paid special attention to this display on the part of the male eagle which happened at the time to be sitting on a pine at my Dawson County ranch. Soaring skyward, he suddenly closed his wings, and dropped head-foremost like a spent rocket, until the increasing impetus was checked by spreading them. After his first tumble the eagle shot upwards and repeated it, when he returned to the tree before resuming his aerial performance. The bird employs a somewhat similar manoeuvre, but poised at a lower elevation, for capturing prairie dogs, to which I shall again refer.

At the above mentioned date (Feb. 25) the Knowlton eagles were observed to be patching up their nest, and, while this seemed to give promise of a very early brood, the downy young eventually

appeared about the same time as the badland eaglets. On April 1 the female was sitting on two eggs, and on May 2 the young were hatched out. For birds of their wild shy nature these eagles are wonderfully tame. On April 13, I rode under the branch of a pine in which the male eagle sat, and examined him within a few yards. The bird, which had just begun to moult, remained on his perch preening himself during the whole time that I was there and was still thus engaged when I rode away. The female is more nervous, but, if driven from her eggs, will immediately return to the tree and afterwards settle down on the nest. It is fortunate for the birds that their chosen nesting site is on private property where the owner and all his men take a deep interest in their welfare.

Much has been written in regard to the larder of the eagle during the breeding season, and I have read with great interest and instruction the pamphlet on North American Eagles¹ by Mr. H. C. Oberholser, who gives the following estimate of the probable number of Sharp-tailed Grouse destroyed by Golden Eagles in this State. He writes: "Allowing a pair of eagles to every 100 square miles in Montana, which is probably conservative, there would be 1,450 pairs in the State, and should each one of these pairs kill only one grouse per day for the three months during which eaglets remained in the nest, 130,500 grouse would be destroyed in Montana during this period alone, while it is not to be supposed that at other times the eagles refrain entirely from a diet of game birds. Furthermore, since at this time the grouse themselves have young or eggs, the death of the parent birds means usually the loss of the brood, and this would amount at the lowest calculation to double the number of adults (probably much more) or 261,000 young. Adding to this the adults there results a total of 397,500, a number that is astonishingly large, yet doubtless well within the truth. The destruction of young is of course not as detrimental as that of an equal number of adults, for the young have less chance in the struggle for existence and in the above calculation ample allowance has been made accordingly."

The above is a startling indictment against the royal bird, but

¹ The North American Eagles and Their Economic Relations. U. S. Department of Agriculture, Bulletin No. 27, pp. 27-28.

its force is greatly weakened by two considerations which give a somewhat different complexion to Mr. Oberholser's results. In the first place it must be remembered that the "balance of Nature" is maintained by relatively few survivors out of the total number born. "Heavy destruction," to use Darwin's classical phrase, "inevitably falls either on the young or on the old during each generation and at recurrent intervals." Birds of prey or epidemic disease are the necessary complement of grouse. In England we have extinguished the birds of prey and our plethoric grouse moors are periodically swept by a pestilence. With all rapidly increasing species, whether of fur, fin or feather, a periodical destructive agency is not only necessary but beneficent. The eagle is replaced by the bacillus.

In the second place, Mr. Oberholser's figures rest on the assumption that all the Montana eagles live on grouse; but this is a mistake, and his estimated eagle grouse-bag may therefore be considerably reduced. As pointed out by Mr. Frank M. Chapman: "A bird's food habits may vary so greatly with locality that it is as deserving of protection in one place as it is unworthy of it in another."¹ All my observations and enquiries show that Golden Eagles invariably feed themselves and their nestlings upon whatever prey is most convenient to their eyrie. Thus many pairs take very few game birds. For example, large prairie dog towns constitute the domain of the Knowlton eagles, and, in striking contrast to my Fallon pair (which never captured a prairie dog), they subsist almost exclusively upon this rodent. Whereas I never visited the badland eyrie without finding one or more Sharp-tailed Grouse, the Knowlton nest, on the other hand (which I examined two or three times a week), always contained one, and occasionally two prairie dogs. Now, the destruction of prairie dogs is of the greatest benefit to the settlers, as in this locality (Knowlton) they have increased to an alarming extent. On some ranches the rodents play havoc with the crops and "dog towns" have encroached upon miles of good grazing land, reducing it to a desert. The burrows also constitute a serious menace to fast riding horsemen. It is only necessary to read the forcible

¹ Bird Lore, November-December, 1906. p. 213.

paper on 'The Prairie Dog of The Great Plains,'¹ by Dr. C. Hart Merriam, quickly to realize what an unmitigated pest this animal becomes, and how rapidly its towns spread. As quoted therein, Professor W. W. Cooke computes that "32 prairie dogs consume as much grass as one sheep, and 256 prairie dogs as much as one cow." Therefore, whenever eagles, hawks, and owls prey upon these ravagers "they should be protected and encouraged," as recommended in Dr. Merriam's bulletin above mentioned. Only the most energetic measures saved a thirty-acre field of oats belonging to Messrs. Archdale brothers (whose ranch joins that of Mr. Price) from being destroyed by prairie dogs. Despite the liberal use of bisulphide of carbon inside the burrows, combined with frequent shooting of the animals outside, the total estimated summer kill was about 1200 — a number not quite double that credited to the Golden Eagles during the nesting season alone.² A hungry eagle will eat two prairie dogs for a meal, but allowance must be made for the fact that females during incubation consume half of what they require at other times. Relying both on what I have myself seen at the eyrie, and upon the observations of others, I have compiled the following statistics.

Throughout the month of April, and for two days in May, allowing an average of three prairie dogs per diem, we get a total of 96 prairie dogs up to the time that the eaglets are hatched. Subsequently, until the young birds forage for themselves (about Aug. 1), if we allow only six of the rodents a day, the total is obtained of 540 prairie dogs for seventy-four days sustenance of four eagles. Thus we have a grand total of 636 prairie dogs during four months for one pair of eagles, which is probably well within the mark.³ An eagle intent on capturing a prairie dog floats leisurely above the 'town' at a medium height on motionless wings. Preliminary inspection of the hunting-ground is accomplished in wide circles or long sweeps, perhaps two or three miles each way, so as not unduly to alarm the game. Passing over at long intervals, the

¹ Yearbook U. S. Dept. of Agriculture, 1901, pp. 257-270.

² Besides those suffocated, large numbers of prairie dogs were driven by the bisulphide fumes to migrate, and were observed on their travels by Messrs. Archdale.

³ In an interesting article on the Golden Eagle, Mr. William L. Finley estimates that the family of California Eagles observed by him consumed 540 ground squirrels in three months. (Condor, Vol. VIII, 1906, p. 10.)

bird scans the dog town and judges of the prospect for a successful stoop. The 'dogs' are of course immediately on the alert, but can only see their enemy for a short time on account of the high surrounding pine hills, and, indeed, most 'dog towns' are too extensive for the denizens at one end to notice an eagle passing over at the other. Moreover, an unsuccessful eagle will keep on the wing for several hours, and it is almost certain that the hungry prairie dogs will relax their vigilance at last. When the eagle considers that a favorable chance has arrived it sinks lower, so as to bring the distance between itself and the animals to something like seventy-five or a hundred yards. Should the latter still remain above ground, the royal bird suddenly folds its wings, and, with meteoric rush, falls head first towards the astounded prairie dogs. These scamper for their holes, but about three yards from the ground the eagle spreads its wings and, swiftly following the intended victim, darts out a cruel foot to grasp it. If the attack fails, as sometimes happens, the eagle mounts in a slow, reluctant manner which plainly reveals its disappointment. On May 3 Mr. M. M. Archdale (on a sulky plough behind three horses) drove within a hundred yards of the male eagle when it stooped for, and just missed a prairie dog in the manner above described. His minute observations corroborate mine from a far greater distance. On a different day two other observers saw the same bird successfully seize a prairie dog, but drop it after rising to a considerable height. The eagle made no effort to recover its booty, and such behavior is rather difficult to explain. I suggest that as a prairie dog is carried in one foot the quarry, in its death agony, may have severely bitten the bird's free leg incautiously advanced.

My brother, Mr. Allan Gordon Cameron, who has had considerable experience of Golden Eagles in Argyllshire, believes that they distinctly prefer furred to feathered game. Their favorite food is the Mountain Hare (*Lepus variabilis*), and a dead cat is a sure draw to a trap, if eagles are in the neighborhood. When hares are scarce, or entirely absent, as in the Island of Jura (Inner Hebrides) eagles take rabbits, if accessible, and failing rabbits, perforce prey on grouse, with the devastating results above mentioned by Mr. Oberholser. These results in Jura, however, were due to the grouse leaving the ground in panic, rather than to their

actual destruction by the eagles. During the deer-stalking season, in autumn, eagles find a supplementary food supply in the offal of deer. For a long time in Scotland it was thought doubtful if the Golden Eagle ever struck at flying birds, but Mr. Seton P. Gordon has conclusively shown that it does so with the wing, and that many grouse and ptarmigan are thus dashed to the ground.¹

To come back to Montana: during the winter of 1906-'07 the Knowlton eagles fed almost entirely on carrion, and three of these birds were regular evening visitors to some cattle carcasses in the willows and box elders along the creek where I lived. A collie used to slink away to this place at sunset, whose disappointed barking often signalled the presence of the royal birds, which kept him at a respectful distance. It was the dog which first brought this habit of the eagles to my notice, as, hearing him bark, I went to find out if a wolf (*Canis lupus* var. *occidentalis*) or other wild animal was guarding the carrion.

The winter of 1906-'07 was the most severe in my eighteen years' Montana experience. For two months the snow lay a foot deep and upwards on the level, and the eagles doubtless found it a difficult matter to obtain sustenance. The Sharp-tailed Grouse and jack-rabbits burrowed into the drifts, and during part of the period the frozen cattle carcasses were proof against the eagles' bills. At Knowlton, on January 14, the thermometer registered -34° at 9 A. M., and all day the spirit never rose above -16° , while on January 15, the temperature varied between -12° at 9 A. M. and -16° at 6 P. M. The famished eagles were compelled to unusual effort, and Mr. R. L. Anderson (who has a ranch in this locality) most kindly sent me a full account of the following remarkable incident. In the middle of January, he was riding two miles below his ranch on the south fork of Cottonwood Creek and suddenly came close upon three Golden Eagles which were devouring an adult buck antelope (*Antilocapra americana*) in a little draw.

Upon his appearance the eagles endeavored to take wing, but all found great difficulty in doing so, "and hopped and fluttered along on the snow for a considerable distance before being able to rise." Despite the bitterly cold weather, the antelope was warm

¹ Country Life, Jan. 27, 1906.

and limber when found, as it had only been quite recently killed. The eagles had torn a large hole in its back with their terrible talons, and were feeding on the kidneys and entrails. Mr. Anderson at once investigated the scene of the struggle and could easily read the gruesome details on the deep, crusted snow. The eagles had obviously stampeded a bunch of antelope, and then cut out a victim by a combined attack. Leaving the herd, the latter endeavored to escape down a small right hand draw, but after covering about a hundred yards was beaten back by the eagles. It then crossed a ridge on which the main antelope trail ran at right angles to its own and, hard pressed by its assailants, struggled down a narrow left hand draw to the place where it succumbed. Altogether the antelope could barely have covered three hundred yards after the first attack by the eagles. The victim, which had evidently offered a gallant resistance, seems to have made a stand in three places, chiefly where found, but also at points along the trail. The crimson stained snow and thickly strewn hair, added to the well defined wing prints of the flapping and dragging eagles, sufficiently revealed this prairie tragedy. One or more of the birds must have clung tenaciously to their quarry's back and from the deep wounds thus inflicted "the blood had spurted out as when a cow's horns are sawn off."

R. R. Brown (the wolfer at Knowlton) informs me that he has often found coyotes in his traps which were partially devoured by eagles. Presumably the coyotes were much debilitated before the eagles attacked them. It is erroneous to suppose that the eagle is "not affected by poisoned bait." Every Montana wolfer has killed eagles in winter with strychnine put out for wolves, and I have myself seen dead birds which had perished from this cause. To quote the late Mr. Howard Saunders, "poison has been a very important cause of the approaching extinction of the Golden Eagle in Ireland."¹ On April 22, the two brothers Archdale saw the male eagle attempt to secure a victim from a north-bound flock of Canada Geese. At sight of the great black bird, which rapidly overtook them, the panic-stricken geese scattered in wild confusion from their usual V-shaped formation, and each member

¹ *Ibis*, Vol. V, 1905, p. 481.



EAGLE EYRIE, KNOWLTON, MONTANA.



GOLDEN EAGLE IN PINE TREE LOOKING DOWN, AT PHOTOGRAPHER.



YOUNG GOLDEN EAGLES, ABOUT TWO MONTHS OLD.

of the flock mounted separately until a mere speck. Meanwhile the eagle endeavored to rise above one of them, but, finding this impossible, he relinquished the chase and flew slowly southwards in the direction of the eyrie. When their enemy was out of sight the geese again resumed a V-shaped formation and continued their interrupted course. The failure of the noble bird on this occasion arose from the fact that he was moulting, and only acute stress of hunger could have induced him to attack the geese. According to my observations the male eagle began to moult on April 13, as above mentioned, and had renewed his plumage by May 1. The female moulted two months later (in the middle of June), and had finished moulting by June 26, when the young were almost ready to leave the nest. Her plumes could be picked up under the tree. I have known a male eagle to shed four primary quills in one day, and it will readily be seen what a serious handicap is here imposed upon his flying powers. It may be supposed that had the eagle succeeded in mounting above the goose, he would have endeavored to bind to this large quarry after the manner of a falcon. Mr. Oberholser, writing of the Bald Eagle (*Haliaeetus leucocephalus*) attacking Canada Geese (*op. cit.*, 11), quotes Mr. William Brewster as follows: "When close upon its quarry the Eagle suddenly sweeps beneath it, and turning back downwards, thrusts its powerful talons up into its breast."

Shortly after his pursuit of the geese the eagle arrived at the eyrie (where I sat on my horse watching) with a prairie dog for his sitting mate. This she declined, when he took the prey to the ground and ravenously ate it himself, tearing it in pieces with the greatest ease. A prairie dog has a very tough hide, and a Goshawk which I had at this time could make nothing of one unless an incision was first made with a knife. An eagle usually places a prairie dog on its back, gradually devours all the edible portion, beginning near the root of the tail, and finishes by leaving a clean skin with the head, feet, and tail on.

The domestic life of the Knowlton eagles was not different in any important particular from that of the badland birds which I have already described. The male did not share the duties of

¹ Bull. Nutt. Ornith. Club, V, 1880, pp. 57, 58.

incubation, but assisted his partner to shelter the eaglets both from the high winds and hot sun. If the shading hen bird happened to observe me on the hilltop she would immediately squat flat in the nest and imagine herself hidden. This habit was common to both female eagles; their perplexed offspring vainly endeavored to arouse them to a sense of their neglect as long as I remained near. No attempt in the present case was made to secure photographs of the downy white nestlings, as we already had a number, showing them in every stage of plumage from two days old,¹ and we preferred to wait for the eaglets to leave the nest. Although smaller than their badland congeners the Knowlton birds developed sooner, and had entirely lost the fluffy white crop and chin at a month and 26 days old. This suggests the hypothesis that, while a diet of grouse and hares makes the largest eagles, on the other hand, birds fed exclusively on prairie dogs and snakes mature more quickly.

I was unable to verify from personal observation that adult eagles, at least, devour rattlesnakes entire, including the head. Although Sharp-tailed Grouse (*Pediæcetes phasianellus campestris*) and Sage Grouse (*Centrocercus urophasianus*) were common in the neighborhood, I only once saw a bird, or the remains of one, in or near the nest. This solitary exception was on June 26, when from the hilltop at 6 P. M. my wife and I (unnoticed) watched the female eagle entirely pluck and dismember a Sharp-tailed Grouse for her eaglets. The eagle, with her back to us, held the grouse firmly down, by planting a foot at each end, on the now perfectly flat nest. After first pulling out the wing quills, she next attacked the soft clinging body feathers, and got rid of those which adhered to her bill by violently shaking her head. The apparently full-grown eaglets waited patiently one on each side of her, until their supper was ready, and at this point the old bird perceived us and flew away. The eaglets seemed half inclined to follow her example but did not leave the branches. Next morning we were early on the ground with a camera and an ascent of the tree was attempted. Before the cyrie could be reached, however, the female eaglet flew strongly for upwards of a quarter of a mile and settled on the oppo-

¹ See Auk, Vol. XXII, No. 2.

site hillside. My wife immediately walked to the spot and succeeded in catching her by a wing after the eaglet had made several abortive efforts to rise in the calm air. The male also flapped out of the eyrie and landed bouyantly on the prairie but was captured without trouble. Both eaglets were brought back to their nesting tree; they showed no fight, but clung tenaciously with their talons to whatever they could seize, according to the unfailing custom of young eagles, hawks and owls. As was the case in my former experience, there appeared to be a week's difference in age between the eaglets although hatched at the same time.

We have always found difficulty in photographing full-fledged eaglets, a quick exposure in the sun being necessary, and the subjects persistently flap into the shade. If forced to stay in the sun they turn their backs upon it, and thus belie the poetic fancy of "An eagle mewing her mighty youth, and kindling her undazzled eyes at the full midday beam."¹ Although the old birds endure heat better than their offspring, they collapse panting, with wide open mouths and drooping wings, at 100° in the shade. Eagles then present an undignified appearance much at variance with their ordinary noble aspect. The tendency of the eaglets to droop their wings is apparent in all the photographs; in one view (of the rock) the male has quite assumed the absurd pose of the overheated eagle.

After photographing the eaglets we wasted much time and labor in attempting to restore them to the higher branches. As soon as we replaced them, they flew down again, preferring to sit about on fallen pines until their perfected wings should emancipate them, forever, from their surroundings. At this stage we saw little of them, owing to the difficulty of finding them amidst the rocks and forest debris of these wooded glens, but I ascertained that the parents continued to watch over, and to feed them on prairie dogs for another month. It is possible that the old birds attended to their offspring after this time, but the fact remains that during August, when the eaglets were constantly observed on rocks or pines about the ranch, the parents were never seen with them. Whether sitting inactive, or on the wing, the youngsters always

¹ Milton. Tractate of Education.

kept up a harsh whistle which was, undoubtedly, a lament for their absent relatives. Once, when one of them lost the other, it screamed incessantly from a lofty scoriaceous rock until its companion returned. Its cries were audible for half a mile, and attracted my wife's attention within the house. In this particular the young birds differ greatly from more matured eagles which are almost invariably silent and utter no sound even when caught in a wolf trap. On September 6, I watched the eaglets hunting for themselves, and to all appearance they flew quite as strongly as the adult birds. Hence we may infer that an eagle takes three months to acquire its full, and almost unrivalled aerial power.

Mr. Oberholser in his bulletin above mentioned states that "The eagle probably seldom, if ever, carries a weight of more than 10 or at the most 12 lbs." Between these two lies the average weight of the bird itself, and some English writers have recently assumed that the eagle can lift and carry off its own weight in prey or even more. Having been able to devote much time to a study of the habits of two pair of eagles (sixty miles apart), which nested close to a ranch where I lived, I feel convinced that the carrying power of the Golden Eagle is limited to a weight of eight pounds at the very most. To supplement my own experience I wrote, in the first instance, to Mr. James Inglis, for 30 years head keeper to the late Duke of Sutherland, who has probably seen as much of eagles in the Scottish Highlands as anyone now living, and subsequently to my brother, who has resided in north Argyll for 23 years, and enjoyed ample opportunities for the study of wild life in a wild district, where eagles breed annually. The experience of both these observers on the point at issue concurred with my own. They report that no authentic record exists in their experience of a Golden Eagle ever carrying a heavier quarry than a mountain hare (*Lepus variabilis*), whose average weight is from 4 to 6 lbs., or a very young hill lamb of the same, and even less weight. Mr. Inglis also writes: "To give some idea what absurd stories are told about eagles: last year a story went the round of the northern newspapers that an eagle carried away a young child at Bonar Bridge. When this was probed to the bottom it was found that two boys invented the tale and sent it to the 'Northern Chronicle' for fun." Mr. R. L. Anderson informs me that a Golden Eagle

has been seen to carry a kid antelope in Montana, but he did not witness the occurrence himself.

I willingly admit that an eagle of exceptional size, or when stimulated by stress of circumstance to exceptional effort, may lift an exceptional weight. Mr. Harting, for instance, relates a story of an eagle which, while devouring a hare was attacked by a fox, and which in its effort to escape from the bull-dog grip of its antagonist lifted the fox to "a considerable height in the air." The witness of this struggle is not recorded by name, but Mr. Harting says that Robert Gray took pains to verify the story.¹ As given in the London 'Field' for Jan. 11, 1908, the weight of a full-grown dog fox is from 16 to 20 lbs. In this case the eagle possessed a great advantage in having its legs free; there must also have been a wind at the time which enabled the bird to get under way when the fox seized it. Furthermore, we do not know the weight of this particular fox. An eagle always has some difficulty in rising from the ground unless from the top of an eminence with a high wind blowing; and all my observations on Montana eagles confirm the view that an average specimen cannot rise from the level with any weight exceeding 4 or at most 5 lbs. in its talons. A heavy bird like an eagle must have the use of its legs to spring from the earth, and if these are tied, or hampered to any considerable extent, the bird is then unable to rise but flaps along the surface of the ground. In the case of the Golden Eagle, I have amply demonstrated this to my own satisfaction by experiments made with an adult bird caught by one claw in a wolf trap. The eagles which I actually watched carrying prairie dogs to their nestlings held the prey in one foot. On March 21, 1905, my wife and I, when out riding, saw the female eagle of our nesting pair occupied with something at the head of a draw. We rode towards her, and although the eagle could see us coming, she did not take alarm until we were about a gunshot off. Then crouching down she leapt upwards from the ground, and simultaneously spreading her wings flapped down the draw. As the day was calm she continued this flapping until high in air, when she obtained enough wind to sail and circled on motionless wings. We found that she

¹ Recreations of a Naturalist, by J. E. Harting, p. 336.

had just killed a full-grown jack-rabbit and begun a meal upon a hind quarter after tearing out the entrails and placing them on one side. Why did not the eagle carry away her prey as the Knowlton birds did prairie dogs in the face of any disturbance? As she had ample time to do so the obvious inference is that she could not. On the other hand, when flying in a wind the same eagle could lift a very considerable weight from the ground. Messrs. Undem Bros. informed me that while in full flight she lifted a lamb, probably weighing between 10 and 12 lbs., for some distance into the air before its weight compelled her to drop it. It was this bird which afterwards met her doom through her indiscreet attack upon the collie, and, according to the shepherd, never ceased flying even with the dog in her clutches.¹ Doubtless, adult jack-rabbits carried to the eyrie are picked up by the eagles without alighting or much relaxing speed. Nevertheless, only once within my knowledge was a full-grown jack-rabbit taken to an eyrie, and, although the eagles undoubtedly killed numbers of the adult animals, their usual practice was to tear and dismember them on the spot. I have three times surprised an eagle on a full-grown jack-rabbit, and twice saw it actually strike the victim, but the bird made no attempt to carry off its booty on either occasion. The average weight of an adult jack-rabbit is 7 lbs. (the heaviest weighed by me was 8½ lbs.), and from the above facts I infer that the eagles here are reluctant to make the required effort for transporting full-grown jack-rabbits to their eyrie. It may be interesting to state that on the two occasions above mentioned both jack-rabbits were crouching in their sage brush forms, and neither made any move when the eagle was hovering above. The eagle appeared to drop on the paralyzed victim much as a Kestrel does onto a mouse. As both my wife and Mr. M. M. Archdale have seen an eagle stoop at and miss a running jack-rabbit on two separate occasions, I presume that if the quarry ran swiftly away it would possess a chance of saving its life.

There is, in fact, an entire absence of any trustworthy evidence by competent observers that Golden Eagles actually lift and carry away animals larger or heavier than hares or game birds. Differ-

¹ Auk, Vol. XXIV, p. 264.

ences in expanse of wing and body size must not be lost sight of in estimating the carrying power of eagles. When writing of a larger bird, the Bald Eagle (*Haliaeetus leucocephalus*), at page 12, Mr. Oberholser quotes Mr. William Brewster as follows: "A Brant or Duck is carried off bodily to the nearest marsh or sand-bar, but a Canada Goose is too heavy to be thus easily disposed of. The two great birds fall together to the water beneath, where the Eagle literally tows his prize along the surface until the shore is reached. In this way one has been known to drag a large Goose for nearly half a mile."¹ Mr. Harting (*op. cit.*) has another interesting fact bearing on the present question and guaranteed by the name of that eminent ornithologist, Mr. A. O. Hume. Writing of Pallas's Sea Eagle (*Haliaeetus leucoryphus*) Mr. Hume says: "A Grey Goose will weigh on the average 7lb. (much heavier are recorded), but I have repeatedly seen good-sized grey geese carried off in the claws of one of these eagles, the bird flying slowly and low over the surface of the water, but still quite steadily" (p. 336). A carp of 13 lbs. proved too big a job for an eagle of this species to tackle (*ib.*, p. 337).

Lamb stories relating to eagles, and current in the Western Isles of Scotland during the first half of the 19th century often refer to the White-tailed Eagle (*Haliaeetus albicilla*), which surpasses its more spirited congener both in expanse of wing and in bodily weight. Alex Clark, late estate servant at Jura, had a vivid recollection of the time when the shepherds on Tarbert farm, now deer forest, were supplied with guns and encouraged to shoot these eagles by a reward of so much per head. A similar war of extermination was waged in other islands, and notably in Skye, where my uncle Donald Charles Cameron, then of Glenbrittle, killed during his lifetime 90 eagles, including both species, to his own gun, as mentioned in 'The Auk' for April, 1905. The fact that these Skye eagles only carried to their eyries leverets, grouse, and small lambs — "helpless creatures easily overpowered" — led the late Mr. Seebohm to describe the motions of the Golden Eagle as "sluggish, cowardly and tame compared with the death swoop of the Peregrine" — a somewhat sweeping verdict which few people will endorse.

¹ Bull. Nutt. Ornith. Club, V 1880, pp. 57, 58.

Although this article is already very long, I cannot refrain from pointing out that Mr. Oberholser has evidently been misled by other writers when he states (page 21) that the Golden Eagle is untamable. In my own experience the bird is not difficult to tame, and even a wild-caught example soon becomes tractable. At first the newly trapped eagle is savage, and, with spread wings, darts out its terrible foot at any advancing object; but by patience, in a few weeks, the bird's confidence may be won. It never uses its bill in attack or defense, but drives its talons into, or through the cause of provocation and then constricts the foot. In this manner a Golden Eagle has been known to kill a full grown otter which had gnawed away the bottom of the wooden partition which separated them.¹ In writing of a male Golden Eagle which he kept for twenty-five days Mr. P. M. Silloway states: "The bird became quite tame and allowed me to caress and handle it through the bars of its box."² I have myself found that the bold, unshrinking nature of the royal bird renders it easier to domesticate than some of the more nervous or timorous hawks.

Mr. James Inglis, above mentioned, informed me that the late Duchess of Sutherland had a tame Golden Eagle which was presented to her in 1866 when it was a year old. A Mr. McDonald first looked after the bird and could handle it in any way he chose. The eagle especially liked to be stroked under the wings, and gave vent to continuous little cries of approval when caressed in this manner. As is always the case, the bird was wild-with strangers, and would strike viciously at them with one foot — the invariable method of attack. Later, this eagle was confided to the care of Inglis, and became on most friendly terms with him, until one day he secured it under a salmon landing-net in order that its house might be cleaned. From this time forward the bird was always suspicious of him, and never again resumed its former amicable relations. The eagle, which was a male, lived in perfect health for 23 years. At the end of that time it fell on its back in a kind of fit, after clutching a rabbit, and died two months afterwards. In reply to a question regarding this eagle Mr. Inglis further states *in lit*: "He moulted every year in May. There were six beautiful

¹ Country Life, Jan. 20, 1906.

² Birds of Fergus County, Montana, p. 31.

fluffy feathers about seven inches long under the tail, and I kept them every year for the Duchess. They were something like ostrich feathers but finer, and her Grace always wore them in her hat. Two of them were pure white, the other four had a small tip of yellow near the point."

In the recently published (1898) second edition of Mr. J. E. Harting's 'Hints on the Management of Hawks' there are three chapters devoted to the domestication, training, and employment of eagles in Falconry which are decisive on the point at issue. Suffice it to say that the Golden Eagle — described as "unerring in its flight" — is highly valued, habitually trained, and successfully employed for the pursuit and capture of foxes, wolves, deer, and antelope both in European and Asiatic Russia. Mr. Harting establishes the fact that this eagle is the well-known *Bergut* or *Kara Kush* (Black Bird) of the Kirghiz Tartars, as hinted by Prof. Newton,¹ although other species are also trained for a similar purpose. The epithet "Black" seems a misnomer for the mature bird, but is quite appropriate to the immature plumage, as pointed out by Mr. Harting, who reminds his readers that the Golden Eagle is described by Linnæus as *A. fulvus*, by Gmelin as *A. niger*, and by Pennant as the "Black Eagle."

Mr. Harting was personally acquainted with a French sportsman, Monsieur Maichin, who after much negotiation succeeded in purchasing a trained *Berkute* from a Kirghiz Falconer for the price of forty pounds (\$200) and a gun, and employed it for hawking foxes in France! Accounts of the achievements of this bird led Mr. Harting to suspect it was the Imperial Eagle (*A. heliaca*), and, being anxious to identify the species, he asked Mons. Maichin to accompany him to the British Museum of Natural History and there to point out his bird from among the mounted specimens in the collection. Without the slightest hesitation Mons. Maichin pointed to the Golden Eagle with the remark (in French): "There is *my* eagle, but not so big as mine." The same bird was subsequently acquired by a famous French falconer, Mons. Paul Gervais, who described to Mr. Harting how it was managed and flown. When the quarry was a fox the eagle invariably struck

¹ Dict. of Birds, p. 177.

and held with one foot, in the first instance, keeping the other in rest. This, it turned out, was a brilliant manœuvre on the part of the bird, for the moment the stricken fox turned his head viciously to snap at the thing holding him, he received the eagle's spare foot full in the face, and was forthwith rendered powerless. "The strong and curved claws speedily muzzled him, and after a few desperate bounds in the air, he almost gave up struggling, being held as in a trap until the falconer ran up, and with his *couteau de chasse* gave him the finishing stroke." In parts of European Russia trained Golden Eagles are regularly exposed for sale and realize very high prices, being used on large game for which the Goshawk would be unsuitable. About the middle of the last century a Captain Green, of the British army, and resident in England, tamed and trained a Golden Eagle to catch hares and rabbits. Authentic accounts of this bird relate that it was "fairly tractable," but its "great weight and the difficulty of keeping it keen (owing to its power of fasting) made it too troublesome to manage satisfactorily." Evidently the Russian and Khirghiz falconers have overcome these difficulties. (See Harting, *op. cit.*, pp. 170-175.)

NOTES ON THE BROAD-WINGED HAWKS OF THE
WEST INDIES, WITH DESCRIPTION OF
A NEW FORM.¹

BY J. H. RILEY.

EVER since the summer of 1904, when working upon a small collection of birds from Barbuda and Antigua, British West Indies, I have had in mind three specimens of immature hawks which were then provisionally (though doubtfully) referred to *Buteo platypterus*. Since then, they have been shown to numerous visiting and resident ornithologists, all of whom have declared they had never seen the immature northern bird in similar plumage.

¹ By permission of the Secretary of the Smithsonian Institution.

Last winter, upon Mr. Outram Bangs visiting Washington, I took advantage of the occasion to show them to him, whereupon he very kindly offered to send me his series from the Antilles for comparison. This he has now done, and I take this opportunity of extending my thanks, for without this series the following notes would have been impossible. Mr. Bangs's series of fifteen birds is a very fine one, embracing specimens from Cuba, Dominica, and St. Vincent, including the type of *Buteo antillarum* Clark. These, in conjunction with the series in the U. S. National Museum, have enabled me to examine over fifty specimens from the various parts of the range of this species, and it is to be hoped, settle the status of the West Indian forms.

After careful comparison of this material, I am prepared to recognize four forms of "Broad-wings" in the West Indies, as shown below.

1. *Buteo platypterus platypterus* (Vieillot).

? *Falco fuscus*¹ MILLER, Various Subjects Nat. Hist., Pt. 3, 1777, pl. 18.—SHAW, *Cimelia Physica*, 1796, 35, pl. 18 (North America).

? [*Falco*] *fuscus* GMELIN, Syst. Nat., I, i, 1788, 280 (based on Miller pl. 18; not of Gmelin, p. 271).—LATHAM, Index Ornith., I, 1790, 43, no. 103 (same basis).

? *F[alco] cinerascens* BECHSTEIN, Latham's allgemeine Uebersicht der Vögel, IV, 1811, 36 (based on Latham, Index, I, 43, no. 103).

Falco pennsylvanicus WILSON, Am. Orn., VI, 1812, 92, pl. 54, f. 1 (near the Schuylkill, Penn.; not of Wilson, t. c. 13, pl. 46, f. 1).

¹ *Falco fuscus*, although commonly attributed to Gmelin, and supposed to represent the Sharp-shinned Hawk (*Accipiter velox* of American authors), was first proposed by J. F. Miller, in a work entitled "Various Subjects of Natural History etc." (so quoted by Engelmann, Bibl. Hist.-Nat., 1846, 182), usually referred to by Gmelin, Latham, and other early authors as "Miller's Illustr." *Falco fuscus*, from North America, is the subject of plate 18, and an examination proves it to be an immature *Buteo*, probably *B. platypterus*, but the tail is too fulvous, and the dark brown sub-terminal band is much too narrow. However, for an old plate, it is a fairly good representation of the Broad-winged Hawk, but by no stretch of the imagination can it be made to do duty for an *Accipiter*. As this plate is the sole basis of Gmelin's description, it follows that *Falco fuscus* of that author cannot apply to the Sharp-shinned Hawk.

Miller's work was issued in six parts, of 6 plates each, and plate 18 occurs in part 3, dated 1777. As the work is very rare, it may be worth mentioning that the plates (with the same names and notation), with some additional ones, were reissued in 1796, as the "*Cimelia Physica*," with enlarged text by George Shaw. Under this title the plates of Miller's 'Various Subjects' may be consulted in lieu of the rarer work. For much of the data on this subject I am indebted to Dr. C. W. Richmond.

- S[parvius] platypterus* VIEILLOT, Tabl. Encycl. Méthod., III, 1823, 1273 (founded on Wilson, pl. 54, f. 1).
- F[alco] Wilsonii* BONAPARTE, Jour. Acad. Nat. Sci. Phila., III, April, 1824, 348 (based on Wilson, VI, 92).
- F[alco] latissimus* BONAPARTE, Journ. Acad. Nat. Sci. Phila., III, April, 1824, 348, footnote (same basis as preceding).—ORD, Wilson's Am. Orn., 2 ed., 1824, 92 (dated 1812, but for correct date, see Faxon, Auk, 1901, 217).
- Buteo pennsylvanicus* BONAPARTE, Comp. List Birds Europe and N. Am., 1838, 3.—BREWER, Proc. Boston Soc. Nat. Hist., VII, 1860, 306 (Cuba).—CABANIS, Journ. für Orn., II, Suppl. 1855, lxxxii (Cuba).—GUNDLACH, Journ. für Orn., 1861, 403 (Cuba), 1871, 366 (Cuba); Orn. Cubana, 1876, 41; Anales Soc. Esp. Hist. Nat. Madrid, VII, 1878, 160 (Porto Rico).
- [*Buteo*] *pennsylvanicus* GUNDLACH, Journ. für Orn., 1861, 322 (Cuba).
- [*Buteo*] *pennsylvanicus* GUNDLACH, Repert. Fis.-Nat. Cuba, I, 1865-66, 223; Journ. für Orn., 1878, 158 (Porto Rico).—CORY, List Birds W. I., 1885, 22 (part).
- B[uteo] pennsylvanicus* GUNDLACH, Anales Soc. Esp. Hist. Nat. Madrid, II, 1873, 99 (Cuba).
- [*Buteo*] *pennsylvanicus* GUNDLACH, Journ. für Orn., 1874, 310 (Porto Rico).
- Buteo latissimus* LEMBEYE, Aves de Cuba, 1850, 19.—CORY, Auk, 1887, 40 (part); Birds W. I., 1889, 198 (part); Cat. Birds W. I., 1892, 99 (part).—GUNDLACH, Orn. Cubana, 1895, 21 (Cuba; habits, etc.).
- B[uteo] latissimus* LEMBEYE, Aves de Cuba, 1850, 127.
- Buteo platypterus* FAXON, Auk, 1901, 218.—A. O. U. COMM., Auk, 1901, 299.

A series of six adults (three males, two females, and one marked female, but probably wrongly sexed) from Cuba are uniformly clove brown above; with sides of neck, mantle, lesser wing-coverts, and scapulars rather strongly edged with cinnamon-rufous; below, the barring is cinnamon-rufous, heavier on the chest. Birds from the eastern United States exhibit apparently two phases of plumage; a light grayish brown backed bird with little or no reddish edges to the feathers, and with the bars below prout's brown; and a dark bird with the feathers of the sides of neck and upper back strongly edged with cinnamon-rufous, and the bars below of the latter color, heavier, and sometimes confluent on the chest. There are no individuals in the series from Cuba corresponding to the gray phase of the continent, but the dark phase is hardly or not at

all different from eastern United States examples. In size, the Cuban birds may average a trifle smaller, but not enough to warrant separating them as a race. Unfortunately there are no birds from Florida in the series examined by me, nor have I seen a specimen from Porto Rico, but judge specimens from the latter locality will not differ from Cuban examples.

Broad-winged Hawks from the United States usually have the irides brown, but Mr. Frank L. Burns writes me that they undergo many changes from pearl-gray of the young, to yellow and in one instance even red, and is inclined to think that the yellow irides are probably that of fully adult birds. In two apparently fully adult birds (one contained an egg ready for deposition, but was unfortunately broken by the fall of the bird) shot by Mr. William Palmer and me at San Diego de los Banos, western Cuba, the irides were brown, as in the majority of northern birds, but on the labels of three of Mr. Bang's specimens from eastern Cuba the color is noted as "straw yellow, with a brown wash." Gundlach¹ gives the color of Cuban specimens as "ochraceous with an inclination to dark gray," and in Porto Rican² specimens as "ochraceous-yellow, with a gray wash."

2. *Buteo platypterus antillarum* (Clark).

Buteo pennsylvanicus LAWRENCE, Proc. U. S. Nat. Mus., I, Oct. 15, 1878, 194 (St. Vincent); Feb. 13, 1879, 273 (Grenada); May, 1879, 487 (part).—LISTER, Ibis, 1880, 43 (St. Vincent).—ALLEN, Bull. Nuttall Orn. Club, V, 1880, 169 (Santa Lucia).—WELLS, List Birds Grenada, 1886, 6; Proc. U. S. Nat. Mus., IX, Feb. 11, 1887, 622 (Grenada; nest and eggs).—SCLATER, P. Z. S. London, 1889, 395 (Santa Lucia).

[*Buteo*] *pennsylvanicus* CORY, List Birds W. I., 1885, 22 (part).

Buteo latissimus CORY, Auk, 1887, 40 (part), 96 (Martinique); Birds W. I., 1889, 198 (part); Cat. Birds W. I., 1892, 99 (part; ? Martinique, ? St. Lucia, St. Vincent, Bequia, Cannouan, Carriacou, ? Barbados).

Buteo antillarum CLARK, Proc. Biol. Soc. Wash., XVIII, Feb. 21, 1905, 62 (Chateaubelair, St. Vincent; type coll. E. A. & O. Bangs); Proc. Boston Soc. Nat. Hist., XXXII, No. 7, Oct., 1905, 241 (descr.; habits; eggs).

¹ Orn. Cubana, 1895, 22.

² Anales Soc. Esp. Hist. Nat., VII, 1878, 161.

The bird named *Buteo antillarum* by Mr. A. H. Clark differs from the Cuban series principally in size, being smaller; in having the throat generally darker and the barring on the thighs averaging narrower; there are apparently no other differences.

Mr. Clark¹ gives the color of the irides of the St. Vincent bird as "yellowish white in all stages," and describes² the eggs as "dull bluish white in color and . . . unspotted," but Mr. J. G. Wells³ says they are "buff color, spotted and blotched with reddish brown." This latter condition may be unusual, however.

The U. S. National Museum has an immature bird from Grenada, marked male, but probably a female, and an immature female from Tobago, which, though large for this form, probably belong to it, or are migrants from further north—an improbable supposition, as this hawk is not known to be a migrant in the West Indies, to my knowledge. Although I have only examined specimens of this form from two other islands of the Lesser Antilles, besides the above, I think I am safe in assigning the records from the following islands to it: ?Martinique, Santa Lucia, St. Vincent, Bequia, Mustique, Cannouan, Carriacou, Grenada, ?Tobago.

3. *Buteo platypterus rivierei* (A. H. Verrill).

Buteo pennsylvanicus LAWRENCE, Proc. U. S. Nat. Mus., I, July 30, 1878, 65 (Dominica).—SCLATER, P. Z. S. London, 1889, 326 (Dominica).

[*Buteo*] *pennsylvanicus* CORY, List Birds W. I., 1885, 22 (part).

Buteo latissimus Cory, Auk, 1887, 40 (part); Birds W. I., 1889, 198 (part); Cat. Birds W. I., 1892, 99 (part; Dominica).—G. E. Verrill, Trans. Conn. Acad. Arts and Sci., VIII, 1892, 325 (Dominica).

Buteo (latissimus) rivierei A. H. VERRILL, Addition[s] to the Avifauna of Dominica, no date, but published about Oct., 1905, p. — (Dominica; habits, etc.).

The series from Dominica are darker than specimens from St. Vincent, more sooty above, more heavily marked below, and with the bars darker, as has already been pointed out by Mr. A. H. Clark.⁴

¹ Proc. Biol. Soc. Wash., XVIII, 1905, 62.

² Proc. Boston Soc. Nat. Hist., XXXII, 1905, 243.

³ Proc. U. S. Nat. Mus., IX, 1887, 622.

⁴ Proc. Biol. Soc. Wash., XVIII, 1905, 63; Proc. Boston Soc. Nat. Hist., XXXII, 1905, 241.

In size there is very little difference between St. Vincent and Dominica specimens. This is probably a fairly well-marked insular form, depending upon its darker coloration for recognition.

Mr. A. H. Verrill, in his description of this form, gives the irides as "white or pale straw at all ages and in both sexes," and describes the eggs as "dull white, heavily washed and blotched with rufous, umber and grayish brown." If the measurements given by him are correct (1.80 by 1.50 to 1.85 by 1.55), the eggs seem to average smaller than eggs from the eastern United States.

4. *Buteo platypterus insulicola* new subspecies.

Buteo pennsylvanicus? LAWRENCE, Proc. U. S. Nat. Mus., I, Dec. 10, 1878, 236 (Antigua).

[*Buteo*] *pennsylvanicus* CORY, List Birds W. I., 1885, 22 (part).

Buteo latissimus CORY, Auk, 1887, 40 (part); Birds W. I., 1889, 198 (part); Auk, 1891, 47 (Antigua; crit.); Cat. W. I. Birds, 1892, 99 (part; Antigua).

Buteo platypterus RILEY, Smithsonian Misc. Coll. (Quarterly Issue), XLVII, Nov. 8, 1904, 282 (crit.).

Type, U. S. National Museum, No. 119,349, male adult, Antigua, British West Indies, May 29, 1890. Collected by Cyrus S. Winch.

Frontal apex, lores, and a narrow line above and below the eye whitish, with some stiff black bristles; top of head and auriculars grayish brown, with darker shaft streaks; rictal streak darker; occiput white, with the feathers tipped rather broadly with sooty brown; back and rump blackish brown, the feathers of the upper back barred at their bases with white, and slightly edged with wood brown; upper tail-coverts black barred with white; tail black, tipped rather narrowly with dark drab and crossed by two rather wide white bars and an indication of a third that does not reach the shaft on individual feathers; scapulars color of the back, strongly barred with white for about two-thirds of their length, basally; primaries dull black on the outer web and tip, white on the inner web as far as the emargination on the outer feathers, but not reaching the shaft except at the base, the black increasing in area from the outer feathers inwards and turning to dark brown at the base and tip, leaving a large subterminal black band, a small black spot appearing on the inner web on the edge of the white of the second outer feather, increasing in number and intensity inwards on the other primaries, where they become interrupted bars not reaching entirely across the white to the inner web, however; secondaries and tertials grayish brown with a dull black subterminal band, the inner webs of the outer and the inner webs and bases of the inner feathers white, barred with dark brown; wing-coverts grayish brown; primary coverts dull blackish brown, irregularly barred with white on basal two-thirds of

inner webs, the white extending to outer webs at extreme base; lining of wing cream buff, sparsely spotted with small cinnamon spots; axillaries creamy white, with rather narrow bars of mars brown along the shaft; chin and throat white, with narrow dark brownish streakings; rest of underparts white, barred, spotted, or streaked comparatively lightly with mars brown, the streaking or barring heavier on the chest, decreasing on the abdomen, and ceasing entirely on the under tail-coverts; thighs narrowly barred with mars brown. Wing, 227; tail, 143; culmen, from cere, 18; tarsus, 56; middle toe, 28.5 mm.

Immature female.—U. S. National Museum, No. 191126, Antigua, B. W. I., Sept. 7, 1903. Collected by H. G. S. Branch.

Superciliary region and sides of face white, with a few fine brown streakings, these markings slightly heavier on the post-ocular streak, and more so on the rictal streak; lores, frons and top of head white, broadly streaked with blackish brown, the region in question having the appearance of being equally streaked with brown and white, the streaks much finer on lores and frons; cervix and sides of neck white, broadly streaked with sepia brown; mantle and rump sepia, the feathers narrowly edged with cinnamon-rufous, this edging more pronounced on the rump; upper tail-coverts white, barred with black; upper surface of tail white at the base, this color continuing a short distance down the shaft of the middle feathers, and down the inner web of the outer feathers almost to the tip, remainder of tail hair brown, narrowly edged with white at the tip, with a sub-terminal band of clove-brown, and four or five irregular bars of lighter brown; lesser wing-coverts sepia, with narrow edgings of cinnamon-rufous; middle and greater wing-coverts sepia, irregularly barred and edged with white and a little cinnamon-rufous; alula sepia, white on the inner webs of the feathers, with sepia barrings and some cinnamon-rufous edgings; primary coverts white at the base, on the inner webs, and edging at the tip, sepia on the outer web and inner web on terminal portion with just a trace of cinnamon-rufous, the inner web obsoletely barred with brown; primaries dark brown, darker on the outer feathers, and becoming lighter on the others towards the base, until the ground color of the whole feather gradually becomes uniform dark hair brown on the outer web, all (except the first) narrowly edged at the tip and rather broadly at the base on the outer web with white, the white on the outer web stippled with brown, the inner webs of all the feathers (as far as the emargination on the outer three, and further on the rest) white, barred with black; these bars extend across the brown of the outer but never reach entirely across the white of the inner web; secondaries dark hair brown, white on the inner web, and edged with white at tip and barred with black; tertials white, barred with sepia; scapulars white, barred and tipped with sepia; lining of wing pinkish buff, with a few faint shaft streaks at carpal joint; below creamy white, the jugulum crossed by a scattering band of sparse tear-shaped spots of sepia, the rest of the underparts almost immaculate, except for a few small scattering spots on the flanks, and a few hair lines of sepia on the breast; thighs creamy buff, rather sparsely marked with V-shaped sepia bars.

Another immature female, taken by Mr. Branch at the same time and place (U. S. National Museum, No. 191127), is darker on the back, the feathers more heavily edged with cinnamon-rufous; the markings below are slightly more numerous, and the tail is of a different pattern. The middle feathers are without bars except for the dark subterminal band; the other feathers of the tail are not essentially different from No. 191126, described above, except that the bars are obsolete on the outer web, and on the inner web of the pair next the middle feathers the bars become obsolete towards the base, being broken up into fine spots and stippling. The tail when closed is almost plain dark hair brown, tipped with lighter brown, and with a subterminal dark band, the extreme base white, stippled with brown.

A third immature female obtained on the same island by Mr. Branch (U. S. National Museum, No. 191128, Nov. 26, 1903), is darker than either of the specimens just described, and differs in the pattern of the tail, which is similar to that of the adult. Below, it has begun to acquire a few russet streaks on the chest; the thighs are almost without markings, but otherwise it is not essentially different from the other two.

Remarks.—In a large series of immature specimens of *Buteo p. platypterus* from various parts of its range, and of *B. p. antillarum* from St. Vincent, Grenada, and Tobago, and of *B. p. rivierei* from Dominica, I am unable to find anything approaching the three specimens above described.

The adult is much lighter and smaller than *B. p. antillarum*, and the bars below are narrower and less sharply defined. It is certainly a well-marked insular race, not coming into close contact with any of its relatives on the north or south.

The following table of measurements gives the averages in millimeters, for comparison. I have discarded a number of measurements where the sex was apparently incorrectly determined.

<i>Males:</i>	Wing.	Tail.	Culmen from cere.	{Tarsus.	Middle toe.
4 adults from eastern U. S.	265.2	152.4	18	62.5	33.1
2 adults (unsexed) from Costa Rica	269	154	18 ²	61	33.2
3 adults from Cuba	263.3	154.7	18.8	58.3	32.3
4 examples from St. Vincent ¹	252.7	151.1	18.1	54.7	30.8
2 adults from Dominica	257.5	151.5	19.2	59.2	31
1 adult from Antigua	227	143	18.7	57.7	31

¹ 3 fully grown, but in immature plumage.

² One specimen.

<i>Females:</i>	Wing.	Tail.	Cul- men from cere.	Tar- sus.	Middle toe.
4 adults from eastern U. S.	282	160.8	19.5	58.5	32.7
1 ¹ adult from Mirador, Vera Cruz, Mex.	293	167	—	61.5	33.5
1 ¹ adult Chitra, Veragua	280	163.5	20	64	30.5
2 adults from Cuba	272	160.8	20.5	62	33.3
4 adults from St. Vincent	265	153.9	18.6	56.2	32.5
1 adult from Dominica	263	154	20	57	32.5
1 immature, marked male but probably female, Granada	276	163	19.5	55.5	33.5
1 immature from Tobago	271	171	—	60	30
3 immatures from Antigua	252	149.2	18.7	57.7	31

RECENT NOTES ON BIRDS OF EASTERN PENN- SYLVANIA.

BY RICHARD C. HARLOW.

THE ever changing conditions which are so rapidly encompassing large tracts of our commonwealth naturally necessitate faunal changes. The instinct of faunal distribution in many cases is sacrificed to the greater demand for congenial environment. In this respect different localities affect different divisions of bird life. Among the mountains of Pennsylvania, for instance, we find the element of the Canadian Fauna in the shape of numerous Warblers, Thrushes and Flycatchers steadily decreasing while about Philadelphia it is the Water Birds that have to bear the weight of the onslaught. The cutting off of the large timber has affected the Herons; the draining and filling up of the swampy areas has compelled the Rails to seek other localities, but the Land Birds live on, for the greater part unmolested.

Since Mr. Stone's valuable work on the 'Birds of Eastern Penn-

¹ Unsexed.

sylvania and New Jersey' was published in 1894 no great changes in the bird life of this region have been noticed. But as increased observation renders an increasing amount of valuable ornithological records, it has been deemed advisable by the writer to place on record the following notes, both as a record of present conditions and as a legacy for future reference. Eyesight records have been used at times when specimens were not available but only when the identification was carefully made under favorable circumstances and was practically undeniable. No attempt at an extended list has been made, the species noted being merely those of especial interest to the ornithologist. Practically all the varieties recorded in the following list were taken or observed within twelve miles of the city of Philadelphia and in the counties of Montgomery, Philadelphia and Delaware.

Herodias egretta. AMERICAN EGRET.—The Egret is now one of the rarest of Pennsylvania birds. In former years a few were noted annually in late July and August along the larger streams, but the species is now on the verge of extinction and as its appearance is usually heralded with a charge of shot, it is not likely to increase within our limits. I observed one of these magnificent birds at the Bristol Mill Pond on July 20, 1906, and on July 30, 1906, two were seen together on a pond near Ashbourne, Montgomery County. One of these was shot by a boy, and the wings and head afterward examined by the writer.

Accipiter atricapillus. GOSHAWK.—Large numbers of this hawk invaded Pennsylvania during the month of December, 1906, and not a few found their way into the hands of Philadelphia taxidermists. The writer secured one specimen on January 5, 1907, at Edge Hill, Montgomery Co., from a farmer who had the bird nailed to his barn. All birds seen were in fully adult plumage. The Goshawk is usually a rare winter visitant, but has a decided tendency to occur in 'waves.'

Archibuteo lagopus sancti-johannis. ROUGH-LEGGED HAWK.—In former years this was a common winter resident on the Delaware Meadows. It has frequently been reported by observers but very few specimens have been taken in recent years, and it is likely that not a few Rough-leg records have in reality been immature Red-tails. It is now an uncommon species.

Falco columbarius. PIGEON HAWK.—A Pigeon Hawk was shot by Mr. James Camblos at Fort Washington, Montgomery Co., in late September, 1904. Recognizing the rarity of the bird, Mr. Camblos had it mounted and later presented it to the writer. This specimen has the adult slate-colored back and is the only authentic record for this section in several years.

Asio wilsonianus. LONG-EARED OWL.—The Long-eared Owl seems to be more common in the last two years than formerly. It has been found to be a frequent winter resident within the city limits, while about Edge Hill it is a rather common bird in late fall and through the winter, and undoubtedly nests. Specimens in the writer's possession were taken January 6, 1907, and November 9, 1907. On November 9, 1906, I flushed nine of these owls from an oak sapling to which the dead leaves still clung. The ground beneath was littered with mice pellets.

Asio accipitrinus. SHORT-EARED OWL.—Frequent migrant and winter resident, occurring in small colonies wherever there is an abundance of field mice. Usually leaves by April 1. One observed at Edge Hill, April 19, and again May 28, 1907 (Auk, Vol. XXIV, pp. 438, 439). A specimen in my collection was taken December 6, 1907, at Bridesburg; most common in the river marshes.

Nyctala acadica. SAW-WHET OWL.—Contrary to the experience of most local ornithologists the writer has found this to be a not uncommon winter resident. Owing to its small size and unobtrusive habits it may be easily overlooked. Specimens have been examined which were taken at Oak Lane on October 25 and November 20, 1903; February 6, 1904, and October 28, 1905, while examples have been noted but not secured on January 2, 1905, and November 9, 1906.

Nyctea nyctea. SNOWY OWL.—This large wanderer from northern latitudes is taken annually in the vicinity of Philadelphia, its large size commanding instant recognition. It was especially common along with the flight of Goshawks in December, 1906, when a number were taken about and even in the city. All birds recorded were heavily spotted and no immaculate specimens have been seen from this locality.

Sphyrapicus varius. YELLOW-BELLIED SAPSUCKER.—Though

not infrequently recorded, this sapsucker was not met with as a winter resident until December 28, 1906, at Edge Hill, when one was observed at fairly close range but not collected.

Melanerpes erythrocephalus. RED-HEADED WOODPECKER.—In former years this species was considered as a rare bird during the winter season. Recent observations have shown that it winters regularly, if not commonly, in suitable localities in the counties of Philadelphia, Montgomery and Delaware.

Sayornis phœbe. PHŒBE.—One seen at Oak Lane on January 20, 1905, seems to be the only recent winter occurrence of the Phœbe, although I have seen it as late as December 25, 1907, this last year. Probably occurs regularly in small numbers during mild winters.

Empidonax minimus. LEAST FLYCATCHER.—The Chebec is given a place in the breeding birds of Montgomery County on the basis of my observations in 1906. On June 1, one heard in an apple orchard was supposed to be a late migrant. Passing that way again on July 3, 1906, the bird was again seen and while watched, was observed to feed a full-fledged young one, which was perched on an apple limb. Neither of them were secured but the record is indisputable and is the first for the breeding of this species in Montgomery County.

Corvus ossifragus. FISH CROW.—The Fish Crow appears to be spreading in the vicinity of Philadelphia where it may be found at all seasons of the year, in the winter mingling with the Common Crows and partaking of their habits. Nests most frequently along the Delaware and Schuylkill but frequently back from the rivers. A number build their homes in the parks in the very heart of Philadelphia. Probably more abundant on the Tinicum marshes to the south of the city than elsewhere. It was established as a breeder at that place on April 16, 1907, when the writer took a nest and five eggs along with the female.

Sturnus vulgaris. STARLING.—For years we have been waiting the occurrence of this bird in Philadelphia and now it has come. Whether or not it will prove an agreeable addition to our avifauna is an open question, but Philadelphia bird students have certainly watched for it longingly. Its first occurrence in the city was early in December, 1907, when Mr. Axe, of Frankford, informed us of

mounting two which were captured in that locality. Since that time several more have been noted in various parts of the city.

Dolichonyx oryzivorus. BOBOLINK.—Apparently extending its range to the southward. Formerly a characteristic bird of the Alleghanian and Canadian faunas, it has recently been found to be a fairly common summer resident in south-central Bucks County and within twenty miles of Philadelphia. Has been noted through the summer of 1907 on the Tinicum meadows.

Agelaius phoeniceus. REDWING.—Winter records are rare enough to make it desirable to mention a specimen taken at Tinicum, January 20, 1906, by Mr. Paul Lorrilliere.

Euphagus carolinus. RUSTY BLACKBIRD.—A not uncommon winter resident on the Tinicum meadows, usually noted in flocks. Perfectly regular.

Pinicola enucleator leucura. PINE GROSBEAK.—A flock of ten individuals was seen by the writer on November 18, 1903, and two specimens were secured but not preserved. One of these was a mature male. The birds were not shy, feeding in a catalpa tree and, when alarmed, took flight uttering their clear, musical whistle. The Pine Grosbeak is a very rare bird in this locality and this is the third record.

Loxia leucoptera. WHITE-WINGED CROSSBILL.—A flock of about eight crossbills of this species were seen in a clump of spruce trees, at Ashbourne on December 1, 1903. One specimen was secured.

Acanthis linaria. REDPOLL.—An erratic winter visitant. Occurred in flocks of immense numbers during late February, 1907, during which time it was noted at numerous localities about the city. I observed one flock of eight hundred or more on February 20 and secured seven specimens. This flock was still in the same locality on March 5. The habits and notes of the Redpoll are very similar to those of the Goldfinch. All the specimens secured are referable to this race. It is important, however, that all Pennsylvania Redpolls should be closely examined as there is a possibility of other forms being taken.

Passerina nivalis. SNOWFLAKE.—Erratic winter visitant usually occurring in "waves." A number of flocks were observed about Philadelphia during February, 1905. A small bunch of about twenty were noted on February 25 and 26 at Oak Lane.

Calcarius lapponicus. LAPLAND LONGSPUR.—One individual of this variety was observed on November 22, 1904, at Frankford, Philadelphia County, by Richard F. Miller. This is the third record from southeastern Pennsylvania, the others being one secured in 1849 by John Cassin, and a specimen taken by C. D. Wood in 1864 (Cassinia, 1906, p. 63). Though the specimen was not secured I have full faith in Mr. Miller's identification.

Poœcetes gramineus. VESPER SPARROW.—A specimen secured at Edge Hill by the writer on December 28, 1907, makes an addition to the few winter records.

Melospiza georgiana. SWAMP SPARROW.—Generally supposed to be a scarce winter resident. Recent developments have shown that they winter abundantly and regularly on the Tinicum meadows.

Pipilo erythrophthalmus. CHEWINK.—A rare winter resident. Specimens observed at Tinicum, December 18, 1905, and January 20, 1906.

Riparia riparia. BANK SWALLOW.—At the time of publication of Mr. Stone's book, this was thought to be a rare breeder. It is now ascertained to be an abundant though local summer resident. Colonies breed at Ridley Park and Chester, Delaware County.

Lanius borealis. NORTHERN SHRIKE.—Observed one specimen on February 22, 1905, at Oak Lane.

Lanius ludovicianus migrans. MIGRANT SHRIKE.—One specimen referable to this race was taken at Edge Hill, on December 1, 1906, by the writer.

Dendroica discolor. PRAIRIE WARBLER.—Several specimens were observed on September 18 and 19, 1907, and one immature female was secured which is now in the writer's collection. Notwithstanding the fact that the Prairie Warbler is a common summer resident across the Delaware, in New Jersey, it is at all seasons a rare bird at Philadelphia. Apparently more common in spring than fall. The above specimen seems to be the only fall record for Montgomery County.

Geothlypis agilis. CONNECTICUT WARBLER.—Erratic fall migrant. No recent spring captures. The Connecticut Warbler was exceedingly common in the fall of 1907, and specimens were secured on September 18, 19 and October 7. All birds examined were exceedingly fat.

Geothlypis philadelphia. MOURNING WARBLER.— One individual of this bird was observed at close range at Edge Hill on May 12, 1907, and another at Oak Lane on May 31, 1907. These are my only records of this species and the bird will have to be regarded as a very rare migrant. Both identifications were made with great care.

Sitta canadensis. RED-BREASTED NUTHATCH.— This erratic bit of bird life was unusually abundant in the fall of 1906, and from September until late November was seen on practically every field trip. These periodical invasions of Red-breasted Nuthatches seem worthy of note. The last one of any size occurred in 1903. For several years the bird will be rare and then, again, take a place among our common transients.

Hylocichla fuscescens. WILSON'S Thrush.— The Veery formerly nested in the vicinity of Glenside, Montgomery County, which is the most southern locality of its breeding in Pennsylvania. Several times in the past two years the writer has heard in June and July notes which he was practically sure belonged to this bird but was unable to secure any specimens.

BIRDS OF DELAWARE — ADDITIONAL NOTES.¹

BY C. J. PENNOCK.

THE 'Preliminary List of the Birds of Delaware,'² was intended to embrace such species only as had come under the observation of the authors or for which they could find positive record of an occurrence within the State. On account of the limited amount of time that had been devoted to the work previous to the appearance of that list it was evident that many species of birds remained to be noted and some species recorded therein as rare might become apparently more abundant after further observations.

¹ Read at the meeting of the American Ornithologists' Union, Philadelphia Pa., Dec. 12, 1907.

² See 'The Auk,' Vol. XXII, No. 2, April, 1904, pp. 194-205.

The present paper is intended to present a list of such birds as have not previously been recorded from Delaware and to offer notes on some other species that seem to be of especial interest. Referring first to species not previously recorded:

1. The RED-HEADED WOODPECKER (*Melanerpes erythrocephalus*) and (2) MAGNOLIA WARBLER (*Dendroica maculosa*) were omitted from the 'List' inadvertently. Both are of course common birds in Delaware. The Woodpecker is usually resident throughout the entire State and at times is locally abundant. Over at least the lower half it is generally to be seen in suitable localities; the large undrained timbered areas offering attractive feeding grounds for this bird as well as for other members of the family. The countrymen generally are familiar with this bird, and its vernacular name of "Shirt-tailer" is in recognition of the noticeable white patch so prominent in a rear-flight view.

The Magnolia Warbler is a common spring and fall migrant.

3. LAUGHING GULL (*Larus atricilla*).—Undoubtedly this bird was an abundant summer resident, at least from Lewes down along the coast to Fenwick Light, at the Maryland line, up to the time of the extermination of our shore-nesting birds, twenty or more years ago. Many of the younger generation of native gunners do not know this bird at all. As they are now found nesting locally in some places on the Atlantic coast considerably to the north, they probably pass up along the sea coast of Delaware, and closer observation should discover them more frequently than has yet been done. I saw two Laughing Gulls May 20, 1907, flying northward at Indian River Inlet. My two companions, native fishermen, were not familiar with them as birds usually to be seen in that locality.

4. FORSTER'S TERN (*Sterna forsteri*).—On May 14, 1905, I shot a female Forster's Tern as it sat on a sand-bar in Indian River Bay near the Inlet. Another bird of apparently the same species and numbers of Least Sandpipers were feeding together at the time.

5. AMERICAN MERGANSER (*Merganser americanus*).—Presumably a rather abundant winter resident. I have noted several seen May 8, 1906, flying up the coast at Rehoboth, and two birds near Ocean View May 21, 1907.

6. RED-LEGGED BLACK DUCK (*Anas obscura rubripes*).—I have

a specimen shot near Odessa about November, 1898. Another was shot May 13, 1905, on Indian River Bay, but it was a cripple, probably gun-shot in the early spring. The gunners of Indian River country recognize the distinction in the two Black Ducks. They state that the "Nigger" Black Duck, as they style it, is the smaller and frequently nests with them, while the larger bird which they call "Red-Paddle" never breeds thereabouts.

7. TRUMPETER SWAN (*Olor buccinator*).—In Bulletin No. 26, of the Biological Survey, page 86, Mr. Cooke states: "During its migrations it occasionally strays to the Atlantic slope," and brackets a record (November 9, 1886, Lincoln, Del.).

8. PECTORAL SANDPIPER (*Actodromas maculata*).—There is a specimen in the Bush collection at Wilmington taken in the State several years ago, about 1878. Probably occurs at the present time as a spring and fall migrant.

9. HUDSONIAN GODWIT (*Limosa hæmastica*).—On May 8, 1906, I saw a pair of these birds on a marsh a mile north of Rehoboth. I have heard gunners occasionally speak of seeing "Marlin" but have found no specimen in any collection.

10. AMERICAN OYSTER-CATCHER (*Hæmatopus palliatus*).—Seemingly rare at the present time. I recently saw a handsome mounted specimen in a small collection of birds near Wilmington. This bird had been shot in early summer of 1862 at or near Port Penn, on the Delaware River, about 20 miles south of Wilmington. I have no recent record.

11. AMERICAN ROUGH-LEGGED HAWK (*Archibuteo lagopus sancti-johannis*).—Mr. Oberholser has called my attention to a Delaware record for this bird in the 'Catalogue of the Birds in the British Museum', Vol. I, p. 198, 1874. No date is given for the capture. A black hawk was caught in a steel trap near Stanton, in the northern end of the State, on February 7, 1902, and another was taken in a similar manner near the same place "at an earlier date." Both these birds are preserved.

12. GOLDEN-WINGED WARBLER (*Helminthophila chrysoptera*).—Mr. Lyman, near Wilmington, has a male taken May 13, 1900. Presumably they are regular spring and fall migrants.

13. CONNECTICUT WARBLER (*Geothlypis agilis*).—Probably not uncommon as a fall migrant. I usually see them more or less

abundant near my home, three miles north of the Delaware State line, during September and early October. I saw two near Delaware City September 3, 1906.

14. WILD TURKEY (*Meleagris gallopavo silvestris*).—This bird of course long ago disappeared as the country became settled. It was undoubtedly abundant during at least the first half of the seventeen hundreds along the fresh water streams of the upper portion of the State. Hesselius, the Swedish preacher, relates the sport to be had shooting the entire flock from trees, by moonlight, during his pastorate at Wilmington, from 1712 to 1724.

15. PASSENGER PIGEON (*Ectopistes migratorius*).—Like the Wild Turkey, but at a later date, the Wild Pigeon has gone from Delaware. Pastor Hesselius records their abundance previous to 1724, and down to 1870 or a little later, I am advised, by the older inhabitants, they were not uncommon in the fall and early spring. There have been quite recent reports of the appearance of this bird in the State, but none sufficiently reliable to record.

Since preparing the original 'List' additional notes have been made on the following:

WHISTLING SWAN (*Olor columbianus*).—"Swans" are reported as not rare, but seldom shot, about Indian River Inlet. One was taken late in the winter (February ?), 1906, probably this species.

GREAT BLUE HERON (*Ardea herodias*).—I have found two small colonies of these birds; one, said to be of long standing, was visited in 1906. At least ten or twelve pairs of birds were nesting, but as wood-choppers were then nearly completing the destruction of all large timber, future nesting there was improbable. A second colony was visited in 1906 and 1907, about ten miles south of Wilmington. On both occasions I estimated there were at least 25 occupied nests, by actual count 52 nests,—as many as 16 nests on one large spreading oak. Several nests of this colony were in the tops of trees, and as they were occupied before the leaves had formed, they were plainly visible at a distance of nearly one mile. I visited this colony April 29, 1906; several nests contained eggs; a set of 4 were perfectly fresh, but there was evidence that many of these nests had been robbed at an earlier date. April 20, 1907, old birds were on nests. April 28, 1907, they were observed to be

feeding young. A severe rain-storm in early May destroyed a large number of the young after they were able to crawl around the tree-tops.

AMERICAN EGRET (*Herodias egretta*).—There are several recent records. In place of “straggler,” as previously recorded, they appear to be rather common in midsummer and may breed occasionally. Mr. Hensel, late of near Stanton, and a close observer, believed a few formerly bred in New Castle County, and I have been so informed by others but have no positive record.

RUFFED GROUSE (*Bonasa umbellus*).—Hesseliuss refers to this bird as abundant in his day. The old residents of northern New Castle County tell me that up to about 1865 or 1870 they were “rather common” in suitable localities,—Ashland, Mt. Cuba, and on the rough, rocky, wooded hill slopes of the Brandywine and Red Clay Creeks.

AMERICAN BARN OWL (*Strix pratincola*).—In suitable localities, near large marshes, this owl seems to be rather abundant.

ACADIAN OWL (*Nyctala acadica*).—Mr. Geo. Hensel had three specimens taken near Stanton, one during the winter of 1906–07, the others earlier.

BLUE GROSBEAK (*Guiraca carulea*).—Mr. Hensel had a mounted male bird, shot several years ago near Delaware City, from a bunch of three or four. I saw a male by the roadside near Lewes on May 7, 1906, and I believe they are not rare in the lower end of the State.

SUMMER TANAGER (*Piranga rubra*).—I found a mounted specimen in the Hensel collection shot several years ago near Stanton. Mr. Hensel believes they nested in that locality, which is well up to the northern end of New Castle County.

LOGGERHEAD SHRIKE (*Lanius ludovicianus migrans* ?).—“May breed occasionally” was formerly stated: Mr. Hensel told me that two pairs nested in a hedge by the roadside near Delaware City in 1862. My own records are all for September, October and November of various years.

To complete the record I include four introduced species:

1. “ENGLISH” PHEASANT (*Phasianus colchicus* ?).—Several pairs were purchased and distributed over the State, a few years ago, by the Delaware Game Protective Association, but it is believed they have not survived.

2. EUROPEAN SKYLARK (*Alauda arvensis*).—In the U. S. Agricultural Report for 1853 is an account of an importation of these birds liberated near Wilmington, by a Mr. John Gorgas, who believed that in the following summer they were becoming settled. There is no recent reference to this bird.

3. STARLING (*Sturnus vulgaris*).—A male bird was shot near Odessa, about 1901, from a flock that was seen several times.

4. HOUSE SPARROW (*Passer domesticus*).—A pestiferous nuisance everywhere.

In the 'List' as issued it was stated that no hemlocks had been observed in Delaware. Later I found a few growing five to six miles west of Wilmington on Red Clay Creek and I have recently been informed that Dr. Chas. S. Sargent, in 'The Sylvia of North America,' Vol. XII, p. 64, states that "Southward it ranges through the Northern States to New Castle County in Delaware."

From the foregoing notes and additional evidence, I am led to believe there was good grounds for the statement made in the 'Preliminary List,' to the effect, that the broad waters of the Delaware Bay, acting as a barrier, may explain the appearance of certain birds, much further to the north in Delaware than they are found in New Jersey and on up the Atlantic coast. The Mockingbird was noted as a case in point, and as now appears we can add the Blue Grosbeak, Summer Tanager, Cerulean Warbler, Yellow-throated Warbler, Prothonotary Warbler and Brown-headed Nuthatch.

These birds are all regular summer residents in southern Delaware, and, with the exception of the Yellow-throated Warbler and Brown-headed Nuthatch, are found well up into the central part of the State or beyond, considerably above the latitude of Cape May, N. J.; while in New Jersey I believe every one is extremely rare and, in later years at least, are not found in New Jersey and northward except as stragglers.

The following notes have been made since the above record was read at the Annual meeting of the American Ornithologists Union, Dec. 12, 1907:

16. HOODED MERGANSER (*Lophodytes cucullatus*).—I saw four of these birds on the Bay near Lewes, Dec. 29, 1907.

IPSWICH SPARROW (*Passerculus princeps*).—Two were observed back of the sand dunes near Lewes Dec. 29, 1907, and on the following day Dr. Spencer Trotter of Philadelphia, Penn., saw twelve or more in the same locality, four of which were shot.

SUMMARY.

Previously recorded	211 species
Now recorded	16 "
Total native species recorded	227 "
Introduced species recorded	4 "

THE CASE OF *STRIX* VS. *ALUCO*.

BY J. A. ALLEN.

THE proper type of the Linnæan genus *Strix* has repeatedly been under discussion, the last time, so far as I am aware, by the late Dr. Coues in 'The Auk' for January, 1900 (XVII, pp. 65, 66), where he says: "This is a case on which the last word does not appear to have been said. . . . It involves not only two generic, but also two family names."

It had previously been discussed in 'The Ibis' by Salvin,¹ Sharpe,² and Newton,³ and also by Newton⁴ in his edition of Yarrell, and in his 'Dictionary of Birds' (1894, p. 673), and by Coues in the fourth (1884) edition of his 'Key' (p. 500, 508). Newton and Coues reached the same conclusions, which were in opposition to the view almost universally accepted by other ornithologists.

The commonly recognized type of *Strix* is *Strix flammea* Linn. 1766. The genus *Strix*, however, was founded by Linnæus in 1758, but at that date did not include *Strix flammea*, which was

¹ Ibis, 1875, pp. 66, 67, footnote.

² Contributions to a History of the *Accipitres*. The Genus *Strix* of Linnæus, and its Type. Ibis, 1875, pp. 324-328.

³ Ibis, 1876, pp. 94-104.

⁴ Yarrell's British Birds, ed. 4, I, 1872, pp. 146, 150, 194, 198.

not published till 1766 (10th ed. Syst. Nat., p. 133). Therefore *Strix flammea* cannot be the type of *Strix*, it being not one of the originally included species. For the few who still take 1766 as the date of the beginning of zoölogical nomenclature this is no objection; and it is probably due to the former wide acceptance of this date as the starting point that the recognition of *Strix flammea* as the type of *Strix* has become so ingrained in ornithological literature.

But there is another way in which *Strix flammea* has been construed as the type of *Strix*, namely, by taking *Strix aluco* Linn., 1758, as an earlier name for *Strix flammea* Linn., 1766, as has been done in the 'A. O. U. Check-List of North American Birds,' from the first edition in 1886 to date,¹ and which determination of *Strix aluco* I followed in my recent papers on the types of North American genera of birds, without looking up the matter for myself. Dr. Stejneger, however, having recently called my attention (in conversation) to this point, I have been led to go carefully into the matter, with the results here detailed. While they agree perfectly with the conclusions reached by Newton and Coues, they are based primarily on different grounds, as the foregoing statements show; at least as regards Dr. Coues, who assumed *Strix aluco* Linn., 1758, to be the same as *Strix flammea* Linn. 1766, and as a different species from *Strix aluco* Linn. 1766.

Strix aluco Linn., 1758, is a composite species, including both the Barn Owl and the Wood Owl or Tawny Owl of Europe. His first reference under *Strix aluco* is to Faun. Suec., 1746 ed., p. 17, No. 48, which is the Tawny Owl pure and simple, as shown by the quite full description there given, not one of the characters applying to the Barn Owl, but each unmistakably to the Tawny Owl, and where also all the citations of other authors there given relate to it. This is also the basis of *Strix aluco* Linn., 1766, which everybody admits is the Tawny Owl. At 1758, however, Linnæus gave references under *Strix aluco* to Willoughby's, Ray's, and Albin's unmistakable descriptions and figures of the Barn Owl. Those who have identified *Strix aluco* Linn., 1758 with the

¹ This was also done by Coues in 1884 (Key, 4th ed.) and in 1900 (Auk, 1900, p. 66), at which later date he says: "*S. aluco* Linn. [S. N., I, 10th ed., 1758], p. 93, sp. No. 6, is the Barn Owl, as shown by the references."

² Bull. Amer. Mus. Nat. Hist., XXIII, 1907, p. 333; *ibid.*, XXIV, 1908, p. 39.

later *Strix flammea* have done so by making these references the basis of their determination instead of the first reference, to the Faun. Suec., where Linnaeus himself shows unmistakably the species he intended to indicate by the name *Strix aluco*; and also later (12th ed. Syst. Nat., 1766) by making these same references to Willoughby, Ray, and Albin the principal basis of his *S. flammea*, and restricting *Strix aluco* to No. 48 of the Fauna Suecica.

As *Strix flammea* proves untenable as the type of *Strix*, and as *Strix aluco*, 1758, is not an earlier name, in any proper sense, for *S. flammea*, what then is the type of *Strix*? As *Strix* was not monotypic, and the type was not indicated by the author, the determination of the type necessarily depends upon the action of some subsequent author, or comes into the category of "Cases in which the generic type is not accepted *solely* upon the basis of the original publication."¹

The first author to divide the Linnæan genus *Strix* was Brisson, who in 1760,² separated it into two genera, *Asio* and *Strix*. The type of *Asio* is *Asio asio* Brisson (= *Strix otus* Linn.), and the type of *Strix* is *Strix strix* Brisson (= *Strix aluco* et *stridula* Linn.), on the principle of tautonymy. The type of *Strix*, on the basis of further 'subsequent designation,' is also "*Strix aluco* Linn. ed. 10," on the basis of the A. O. U. Check-List (1886), although the species was there evidently misidentified. Thus *Strix* will replace *Syrnium* Savigny, 1809 (type, *Syrnium ululans* Savigny = *Strix aluco* Linn.).

A substitute for *Strix*, in its currently accepted sense, is found in *Aluco* Fleming, 1822, with *Strix flammeus* Fleming³ (= *Strix aluco* Linn.) as type by original designation, as long ago maintained by Newton (1874-1894) and Coues (1884-1900).

It hence follows that the family name Strigidæ must be transferred to replace Bubonidæ, as was done by Coues in 1884; while the current family name Strigidæ must be replaced by Aluconidæ Coues, 1884 (= subfamily Alucinæ Newton, 1894).

Since the name *flammea* Linn., 1766, is preoccupied by *Strix flammea* Pontoppidan, 1764, for the Short-eared Owl (*Strix accip-*

¹ International Code of Zoölogical Nomenclature, Art. 30, adopted August, 1907.

² Orn., I, 1760, pp. 28, 477, 492.

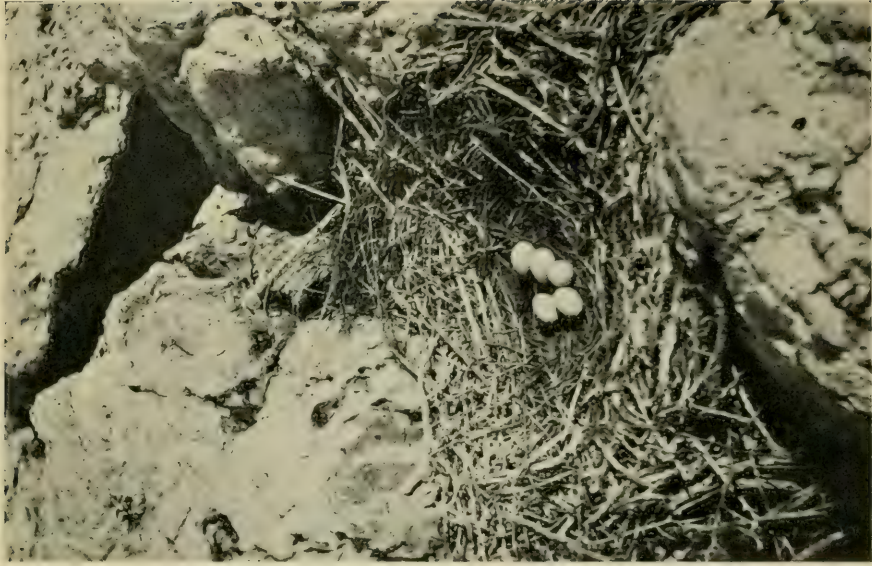
³ Fleming, Philos. Zool., II, 1822, p. 236.



EGG ISLAND, GREAT SALT LAKE, UTAH.
Nesting colony of Great Blue Herons, Cormorants and Gulls.



NEST AND EGGS OF GREAT BLUE HERON (LOWER NEST)
AND DOUBLE-CRESTED CORMORANT (UPPER NEST).



NEST AND EGGS OF GREAT BLUE HERON.

itrina Pallas, 1771), it is necessary to find another name for the Barn Owl, for which the earliest available name appears to be *Strix alba* Scopoli (Ann. I, 1769, p. 2). For those who consider the North American Barn Owl as a subspecies of the European, the name for the American form will be *Aluco albus pratincola* (Bonap.).

TREGANZA BLUE HERON.

BY EDWARD J. COURT.

Plates V and VI.

THIS subspecies has been under my consideration for some time and through Mr. A. O. Treganza, Salt Lake City, Utah, I obtained a specimen, and I have honored him by naming the species *Ardea herodias treganzai*, Treganza Blue Heron.

I wish to express my best thanks to Mr. Harry C. Oberholser, Biological Survey, Agricultural Department, Washington, D. C., who greatly assisted me in describing the subspecies; also to Mr. Robert Ridgway, Smithsonian Institution, who agreed with me that it was a good race; and to Dr. Charles W. Richmond, Smithsonian Institution, for access to the large and handsome series of Great Blue Herons.

Ardea herodias treganzai, new subspecies.

Subspecific characters:—Similar to *Ardea herodias herodias*, but much paler on the neck and upper parts; resembling *Ardea herodias wardi*, but smaller and even paler.

Type:—♀ adult, No. 208756, Smithsonian Institution, Egg Island, Great Salt Lake, Utah; collected April 10, 1907, by Mr. A. O. Treganza.

Forehead and crown white; superciliary stripes black, connecting behind with the black crest, middle feathers of which are 183 mm. in length; lores and ear coverts white; sides of neck very pale cinnamon rufous; interscapular and scapular regions pale bluish slate changing to a silver bluish gray towards ends of feathers; rump deep bluish; tail terminally

bluish black; under tail coverts pure white; bend of wing bright chestnut mixed with white; upper wing coverts and secondaries bluish becoming darker where they overlap the ends of the primaries; primaries bluish black; under wing and primary coverts and axillaries bluish; postocular region, chin, cheeks, and throat white gradually changing into pale cinnamon rufous, the median line formed by a distinct row of black, white and bright reddish chestnut brown feathers; breast and abdomen broadly streaked with white; flanks dark bluish slate; thighs deep reddish brown; bill black.

Geographical distribution:—Great Salt Lake, Utah, Arizona, Texas, and California.

MEASUREMENTS OF *Ardea herodias treganzai*.

Smithsonian No.				Wing.	Tail.	Cul- men.	Tar- sus.	M. Toe.
9472	—	Sacramento Valley, Cal.	—	469.9	178	140	180	109
11706	♀ ad.	Fort Clark, Texas	Jan. 24, 1898	463.5	171	140	172	102
125829	♀ ad.	Mexico, near El Paso, Texas	Feb. 27, 1892	476.2	172	133	172	101
131506	♀ ad.	Fort Lowell, Ariz.	Nov. 7, 1893	467.3	178	140	177	105
133029	♀ ad.	Colorado River, Monu- ment No. 204.	Mar. 22, 1894	469.9	171	142	165	100
133775	♀ ad.	Gardiners Lagoon, Cal.	Apr. 14, 1894	469.9	175	148	165	102
208756	♀ ad.	Gt. Salt Lake, Utah	Apr. 10, 1907	469	177	135	173	108

Average Measurements.

	Wing.	Tail.	Culmen.	Tarsus.	M. Toe.
<i>Ardea herodias treganzai</i>	469.5	174.5	139.5	172	104
<i>Ardea herodias</i>	483.5	178	146	181	108
<i>Ardea herodias wardi</i>	506	193	169	204	124

I am indebted to Mr. Treganza for the following field notes.

Salt Lake City, Utah.

December 4, 1907.

FRIEND COURT:—

The following is a copy of the field notes on the *Ardea herodias* and a slight description of the different islands where I have found this species breeding, in this locality, with a series of photographs.

White Rock Island is an almost solid body of quartz, about 175 feet by 100 feet, rising sheer out of the water on three sides. Extreme height about 25 feet. Located about one-half mile off shore, in a small cove on the north-west end of Antelope Island, Great Salt Lake, Utah.

White Rock, May 15, 1905. Eight pairs found breeding. Four nests contained young; one nest contained both young and eggs; the remaining three nests contained eggs badly incubated. Four other nests were found from which the young had but recently gone. One set of four eggs taken.

Nests composed of sticks, principally of the sage bush, and placed in a rather loose sort of manner between two points of rocks or small hollows. Little or no difference seems to be made in the composition of the inner

and outer nest; in fact there is really no inner nest or lining, and the depression which receives the eggs and contains the young is very slight. The carcass of fish are very plentiful about nests containing young.

The old birds were very retiring, remaining over on the shore of Antelope Island while we were on the White Rock. Nesting in company with *Larus californicus*.

White Rock, May 10, 1906.— Same number of nests as were found May 15, 1905, except that all nests were occupied by either young or eggs.

Hat Island.— The name well describes its form as it appears from a distance. It lies about twenty-five miles due west of White Rock Island and four miles north of Carrington Island, on the west side of the Lake. Three fourths and one half mile are its greatest dimensions, length and breadth. Rises about 90 feet above water line. Formation, decomposed rock, boulders, and sand. Thorny sage and weeds are about the only vegetation to be found.

Hat Island, May 8, 1906.— Found a colony of forty pairs. All stages of nidification existed, except nest building. There seems to be a decided difference in the disposition of the young. Some show signs of fight as soon as you make your presence known, while others pay little or no attention to your doings.

The nests here are placed, some on the rocks and some on top of the large thorny sage bushes which grow from 4 feet to 5 feet high. Some of the nests are very beautiful, being built out of sage branches that have been exposed to the elements until they have become a most subtle gray tone, that fairly vibrates under sunlight. Some of the nests measure from 4 to 5 feet in diameter.

The nearest feeding ground for these birds is the mouth of the Jordan River, some thirty-five miles, almost due east of the island. The flight to the feeding grounds begins about 3 A. M., and by sun-rise all the birds that are going for that day have left the island, except a few isolated cases which may be seen going and coming all day long, the main body returning so that they reach the island by sun-down. Some of these birds travel fifty or sixty miles from the island for food.

A certain portion of the birds always remain on the island during the day. Even were it not for the incubation of the eggs and the care of the young, this would be made necessary through the fact that as soon as a nest of eggs is left unprotected it is immediately pounced upon by the *Larus californicus*, who crack the eggs by pecking and feed on their contents.

Here *Ardea herodias* is nesting in company with *Larus californicus* and *Pelecanus erythrorhynchos*.

Hat Island, Sept. 10, 1907.— Not a Blue Heron to be found on the island. Neither have we found a nest of addled eggs. The birds must have been very successful in the rearing of their young or else the Gulls devoured anything that might have been left.

Much to our surprise we found there had been a tremendous increase in

the number of nests over those which we found last year. On May 8, 1906, we found birds nesting only on the east and northeast end of the island. This year we find that they have circled the island with their nests, with the exception of the southwest end, which is rather sandy and barren of sage and boulders.

Egg Island is a detached reef at the extreme north end of Antelope Island, 300 feet or more in diameter, about one-half mile off shore. Composed mostly of reef rocks but with some little sand patches.

Egg Island, May 11, 1906.—Here the *Ardea herodias* nests in company with *Larus californicus* and *Phalacrocorax dilophus*. This island contained about fifty breeding pairs. All stages of nidification existed except nest building. The nearest feeding ground for the birds on this island is about fifteen miles.

The nests on this island are all placed on the higher boulders among the reef rocks, usually beside a large boulder. The boulder is used as a perch for the owner of the nest beneath. Apparently the birds consider this boulder as much a part of their possession as the nest, for should another attempt to alight on a perch that is not his own, he is immediately and properly punished for his trespassing. Such an occasion as this is the only time I have ever seen the adult birds show any signs of quarreling.

Some of the nests on this island are very handsomely and wonderfully made, two or three nests measuring each about 5 feet in diameter. Most of the sticks used in constructing the nest are of the sage bush. Apparently these nests are very old and have been used for many years, a little bit being added each year in the way of rebuilding and house cleaning. It seems quite remarkable that the young do not injure themselves from the large, coarse sticks which form the inner nest, if the same could be called an inner nest. The depression of the nests is very slight. The depression starts from the outer edge of the nest and very gradually sinks into the center.

The birds on this island seem to be more filthy than those seen elsewhere. By the time the entire clutch of eggs is laid, the first two or three eggs laid are entirely speckled over the surface with lice markings. Upon lifting up eggs that are in an advanced stage of incubation, the center of the nest seems to be a seething mass of lice, which must undoubtedly greatly annoy the young when hatched.

Four, five, and six eggs seem to form the complete set, four or five being the usual complement, six rarely. A number of photographs were taken on this date of both young and eggs.

Egg Island, April 9, 1907.—I do not wonder that some of the young are fully fledged and leave their nests before the middle of May, as we found three nests containing young from three to four weeks old.

About twenty-five nests contained fresh eggs. None of the eggs seemed to be at all incubated; hence there must have been several exceptionally early arrivals. There seemed to be a number of new nests under construction. Two birds killed for identification. Several photographs taken.

Egg Island, May 16, 1907.—I find about fifty per cent. more nests on the island this year than last, or, in other words, about seventy-five pairs of breeding birds have nested there. There are only about five sets of fresh eggs. All the other nests either contained young or eggs well advanced in incubation.

The young are extremely interesting, especially those that are sufficiently fledged to walk about upon the rocks but are yet too timid to attempt flight. The photograph taken gives a very good idea of how close one can approach these almost fully fledged birds. The photograph was taken at a distance of about 6 feet.

Egg Island, Sept. 14, 1907.—Not a Heron left, but a count of the nests shows about fifty per cent. increase over last year.

General Remarks.—On first observation the nests of the Great Blue Heron appear very flimsy, especially the edges, which seem to be very much frayed out and loose. One would think that the storms of a winter would entirely demolish these nests, but on close observation it is found that they are most compactly made, and it is quite evident that the same nests are used from year to year with but very little rebuilding in the spring. One can very easily tell where new sticks have been added, from the fact that they are not sun-bleached, as are the old sticks in the nest.

From seeing the size of the new nests that have been built this year and comparing them with the older nests, one would be very safe in saying that these large old nests are the pioneer homes of these birds and mark their first advent to Great Salt Lake, the date of which we shall omit.

The writer had some little experience with *Ardea herodias* in California. There are some two or three colonies between San Diego and Los Angeles, and in all cases, nests are built in tops of the highest trees. The Eucalyptus seems to be quite a favorite nesting site for this bird. It is not for lack of trees that the bird chooses low elevations for nesting here in Utah, for on Antelope Island, which is not five miles from either Egg Island or White Rock, may be found groves of cedars that are 30 to 50 feet high.

The following is only hearsay, that Utah Lake contains a small colony of these birds. One trip was made to that lake but no nests were found. However, many of the birds were seen feeding and in all probability there is a colony breeding on this lake.

Captain Davis, of Salt Lake, tells me that these birds nest very abundantly on Gunnison Island, more so than on any other island in Great Salt Lake. They are nesting in company with *Larus californicus* and *Pelecanus erythrorhynchos*. Captain Davis has been to this island many times, and it is undoubtedly safe to assume that he is correct in his statement, as he is a very close observer of nature generally.

It is also stated, but I could not vouch for the authority, that there is a colony of these birds nesting in the mouth of Bear River. While we have made two attempts to find the colony, we have as yet been unable to do so. If a colony of these birds does exist at the mouth of Bear River, they are of necessity compelled to nest in the broken down reeds and rushes, as does the Black-crowned Night Heron.

The following shows measurements of eggs:

A set of five rather long eggs: 2.59×1.79 , 2.69×1.58 , 2.73×1.79 , 2.60×1.80 , 2.57×1.79 .

A set of five rather round eggs:— 2.56×1.93 , 2.58×1.86 , 2.51×1.89 , 2.48×1.91 , 2.50×1.90 .

A set of three extremely large eggs: 2.76×1.94 , 2.75×1.91 , 2.74×1.92 .

A set of three extremely small eggs: 2.45×1.82 , 2.51×1.80 , 2.52×1.72 .

A set of six typical eggs: 2.57×1.83 , 2.61×1.77 , 2.55×1.78 , 2.56×1.79 , 2.57×1.81 , 2.58×1.80 , 2.574×1.816 .

The average size, taken from ten sets,—namely: three sets of three each; four sets of four each; two sets of five each; one set of six, is 2.574×1.816 inches.

I endeavored this year to ascertain the exact length of time required for incubation; also from hatching to flight; but found it impossible, owing to the distance and time consumed in reaching their breeding ground.

These notes have been culled from data taken by my father and myself.

Trusting that this may be of some little benefit to you, I remain,

Your most sincere friend,

A. O. TREGANZA.

LARUS KUMLIENI AND OTHER NORTHERN GULLS IN THE NEIGHBORHOOD OF BOSTON.

BY FRANCIS H. ALLEN.

IN reporting in 'The Auk' for April, 1905 (Vol. XXII, p. 205) the taking of a Kumlien's Gull at Moon Island, Boston Harbor, on February 22, 1905, I ventured, though the bird had not previously been recorded from Massachusetts,¹ to say that its presence here was "probably in a sense normal rather than accidental, being simply a southward extension of its usual winter range in a season of unusual severity." The experience of the past winter (1907-08) seems to indicate that *Larus kumlieni* is indeed of normal occurrence on the Massachusetts Coast and not by any means

Dr. Dwight has since recorded an earlier specimen, a young female taken at Plymouth, Mass., January 5, 1888, and now in the Rothschild Museum at Tring, England (Auk, Jan., 1906, XXIII, 41).

confined to the coldest seasons. This last winter was an exceptionally open one up to the latter part of January, and even after that was not unusually severe, but Kumlien's Gull was seen as early as December 29, some days before the last Geese went south, and as late as March 13, a day after the arrival of a great wave of Robins, Bluebirds, Song Sparrows, etc., from the south. The first of these birds was seen by me, December 29, 1907, at T Wharf, Boston Harbor, where the gulls congregate about the fishing schooners. It came within close range repeatedly and was identified beyond question. The dark markings at the ends of the primaries were perfectly distinct though of course much more restricted than those on the Herring Gull's wings. This bird (or one like it) was also observed at the same place by Rev. Horace W. Wright, January 18, 1908, and by Dr. Charles W. Townsend, February 7, both of whom identified it positively.

Mr. Wright also permits me to record two other birds of this species seen by him. One was on the Charles River Basin, Boston, February 10. "It came flying in and lit on the ice, and subsequently took successive flights back and forth before me. For some time I did not detect the gray spaces on the wings, but finally saw them to be unmistakable. The mantle and wings were like those of the Kumlien seen at T Wharf, but it would seem as if the gray wing-spots could not have been as prominent as in the case of that bird. But it may have been the identical bird. This Kumlien showed plainly the red spot at the angle of the bill. I did not perceive this mark on the T Wharf bird, but would not affirm that it was not there." I have quoted Mr. Wright's account in full in order to show the care with which the observation was made. The other bird was seen February 26 on Chestnut Hill Reservoir in the Brighton district of Boston. It rose among a flock of Herring and Great Black-backed Gulls and, "gradually ascending in the air, flew away eastward."

The next Kumlien's Gulls to be observed of which I have knowledge were two seen by myself in a flock of gulls off King's Beach, Swampscott, March 7. They were sitting in the water and, when viewed with a telescope, showed the wing-spots distinctly as they sat. These spots were darker on one than on the other. The bills of both were noticeably smaller than the bills of the Herring

Gulls with which they were associated, and the birds themselves were plainly smaller, though the difference in the bills was more considerable. One of them flew a short distance while I was watching him, and then the wings (at that distance and seen only for an instant) appeared immaculate. The black on the Herring Gull's primaries is very conspicuous in the closed wing, forming a large blotch, while the spots on the Kumlien's Gulls' wings showed only as marks on the separate feathers. Finally, a gull of this species, presumably one of the two observed by me March 7, was seen by Mr. Wright, March 13, at Fisherman's Beach, Swampscott, the next beach down the coast from King's beach. It identified itself by spreading its wings as it sat in the water off shore. All these birds — or both, if it be assumed that there were but two seen at different places — were in the adult plumage.

In connection with this report of Kumlien's Gull, it will be of interest, I think, to note the presence of other northern gulls in somewhat unusual numbers during the past winter. Indeed, the information which I have at hand suggests that neither *Larus glaucus* nor *L. leucopterus* is by any means as rare on the Massachusetts coast as the published records would indicate. The scarcity of such records is partly due to the very laudable hesitation on the part of observers to record birds which are only seen, not taken. It so happens, however, that most of these northern gulls which are seen here are found on protected shores or waters, where shooting is prohibited, so that some interesting occurrences must go entirely unrecorded unless the rule — in general very proper — which demands a specimen to back the record is waived in their favor. It is very probable, too, that the gulls in question are now of recent years more abundant here than formerly, for it is certain that the Herring and Great Black-backed Gulls which winter on our coast have increased under the protection afforded them. All the gulls, moreover, are much more approachable when found on protected ground than they were formerly, and flocks can be readily scanned in search of the rarer species. After conversation with several observers I have deemed it proper to make some statement concerning the recent occurrences of the Glaucous and Iceland Gulls in Massachusetts. The Rev. Horace W. Wright and Dr. Charles W. Townsend, both well known as experienced and careful

observers, have kindly furnished me with their notes on these species for publication in connection with my own.

The first of our records is of an immature Glaucous Gull at T Wharf, Boston Harbor, seen by me, February 16 and 23, and by Dr. Townsend, February 20, 1905. This may have been the same bird as that recorded by Mr. Brewster (*Birds of the Cambridge Region*, p. 92) as having been seen by Mr. Glover M. Allen off Harvard Bridge, January 20 of that year. Another immature bird of this species was seen by Dr. Townsend at Nahant Beach, January 7, 1906, and still another by the same observer at Ipswich, May 26, 1907. Of the Iceland Gulls (*Larus leucopterus*), Dr. Townsend observed one in the Charles River Basin, February 1, 1906, one in immature plumage in Boston Harbor, February 17, 1907, and another, or perhaps the same, young bird in the Basin, March 13. The Harbor bird was seen by me, February 16, at T Wharf. I heard its note once or twice,—practically identical, as it then seemed to me, with the familiar creak of the Herring Gull.

In January, February, and March of this year a company of white-winged gulls, varying in number and composition, was continually seen in a flock of Herring Gulls which frequented King's and Fisherman's Beaches at Swampscott, Mass. These birds were first found January 7 by Mr. Wright, who visited them also on January 13 and 21, February 11, and March 13. On February 22, Dr. Townsend and I saw them, and I observed them also February 29 and March 7. Unfortunately, it was never possible to identify positively every bird in this company, which varied in number from four to seven. Certain individuals, however, were determined beyond the possibility of error. At least two immature Glaucous Gulls were identified, and at least three immature Iceland Gulls. On January 13 Mr. Wright saw two Glaucous Gulls in the pure white plumage there. On the occasion of the visit of Dr. Townsend and myself, February 22, a single adult Glaucous Gull was included in the flock. This was the only adult bird belonging to either species which was noted in this flock, and it was seen but this once. The presence of this bird on this single occasion and that of the two Kumlien's Gulls in the same flock on March 7, and one of that species on March 13, indicate that the make-up of the flock was constantly changing, though doubtless certain individuals remained in the locality most of the time.

At other places on the coast the records for the winter are as follows:—

- 1 adult Glaucous Gull in Boston Harbor, February 7 (Dr. Townsend).
- 1 young Glaucous Gull at Ipswich, March 1 (Dr. Townsend).
- 1 Glaucous Gull in pure white plumage at Marblehead Neck, February 27 (Mr. Wright).
- 1 young Iceland Gull (?) at Devereux, January 16 (Mr. Wright).
- 1 young Iceland Gull (?) at Lynn Beach, February 22 (Mr. Wright.)
- 1 young Iceland Gull (?) at Marblehead Neck, February 27 (Mr. Wright).

The last three birds were not identified positively as to size, and one or more of them may possibly have been *L. glaucus*.

It is not particularly difficult for the trained observer to distinguish the white-winged gulls in the field from the Herring Gull; but as between *L. glaucus* and *L. leucopterus* a positive identification is not so easy, and probably cannot be determined with certainty unless the bird is seen under very favorable conditions and with other gulls close by with which to compare it as to size. One soon gets to recognize the white-winged species flying, even at a considerable distance, and the smaller size of the Iceland Gull is seen perhaps more distinctly on the wing than when the bird is sitting. The bill, when it can be distinctly seen, is an excellent field-mark, the Iceland Gull's, like that of Kumlien's Gull, being much smaller in proportion than are the other dimensions, as is shown by the measurements given by Dr. Dwight in 'The Auk,' January, 1906 (Vol. XXIII, p. 28). The adult Kumlien's Gull, when seen under favorable conditions, is easily distinguished from *L. glaucus* and *L. leucopterus*, for the spots on the primaries cannot fail to be noticed whether the bird is sitting or flying.

Of course the foregoing records lack the definiteness that would have attached to them had it been possible to take specimens in each case, but I trust they will be accepted for what they are worth. At any rate, it has seemed to some of us that it would be worth while to publish them, in the interests of defining the status of these three species as winter visitants to the Massachusetts coast, and with the hope of inciting other observers to watch for them both there and elsewhere.

COLUMBINA VS. CHÆMEPELIA.

BY J. A. ALLEN.

THE case of *Columbina* versus *Chæmepelia* presents unusual conditions and is hence of interest beyond the determination of the types and proper status of these two genera.

The genus *Columbina* was founded by Spix in 1825 (Av. Bras., II, 57, 58, pll. lxxv, lxxv a). There was no diagnosis, and no type was indicated, but four species were referred to it, as follows:

Columbina strepitans, p. 57, pl. lxxv, fig. 1 (= *Columba picui* Temm. 1813); type of *Columbula* Bonap., Consp., II, 1854, 80, by subsequent designation (Gray, 1855).

Columbina campestris, p. 57, pl. lxxv, fig. 2; monotypic type of *Uropelia* Bonap., Consp., II, 1854, 85.

Columbina cabocolo, p. 58, pl. lxxv a, fig. 1 (= *talpacoti* Temm., 1813); type of *Talpacotia* Bonap., Consp., II, 1854, 79, by tautonymy and by subsequent designation (Gray, 1855).

Columbina griseola, p. 58, pl. lxxv a, fig. 2 (< *passerina* Linn., 1766); virtually type of *Chæmepelia* (Swains. 1827) by subsequent designation (Gray, 1840).

Thus in 1854 and 1855 the first three of these four species became types of other genera, leaving only *Columbina griseola*, equal to (or part of) *Columba passerina* Linn., as this species was at that time recognized, the habitat as originally assigned to *passerina* being "America inter tropicos." But before *Columbina* was dismembered by Bonaparte in 1854, *Columba passerina* had already been designated as the type of *Columbina* by Gray (List Gen. Bds., 1840, p. 58).

As *Columbina* meets all the requirements of a properly founded genus, having been duly published, with several species definitely referred to it, and the name being not preoccupied, it must be recognized in nomenclature. All that was lacking from the first to make it a full-fledged and properly defined genus was the designation of a type, which was supplied by Gray, as already stated, in 1840. Whether his designation was a proper one or not will be considered later in the present paper.

The genus *Chæmepelia* was founded by Swainson in 1827 (Zool. Journ., III, Aug.-Nov., 1827, 361), but without designation of a

type, and with only two species referred to it, namely, *Columba passerina* Linn. and *Columba squamosa* Temm. In 1841 Gray (List Gen. Bds., 2d ed., 75) designated *Columba passerina* as its type, a species he had in the preceding year made the type of *Columbina*! The other species was referred by Bonaparte in 1854 (Consp., II, p. 85) to his new genus *Scardafella*, and later it became its type by subsequent designation (Gray, 1855, Cat. Gen. and Subgen. Bds., 100). Selby, in 1835 (Nat. Libr., Pigeons, 198), designated "*Columba Talpicoti* Temm." as the type of *Chæmepelia*, and Swainson, in 1837 (Class. Bds., 349), cited the same species, under a different name ("*Columba cinnamomina*. Spix, II, [pl.] 75a, f. 1" = *talpacoti* Temm.) as its 'example'; but both of these designations were invalid, as the species selected was not originally included in the genus. Hence after *squamosa* was removed in 1854, *passerina* was the only species left in the genus and it thus necessarily became the type of *Chæmepelia* by restriction. But if Gray's act making *passerina* the type of *Columbina*, in 1840, was valid, this would render *Chæmepelia* a synonym of *Columbina*.

The first step in the consideration of this question is to note the fact that *passerina* was not nominally one of the four species originally referred to the genus *Columbina*, but Spix did include in it a species — *griseola* — which is in reality only a slightly differentiated subspecies of *passerina*. Of this, as will be shown later, there can be no question. But the *griseola* of Bonaparte and of nearly all subsequent authors was not the *griseola* of Spix. This explains why "*griseola*" has been usually recognized as either a distinct species or as a synonym of *Columba minuta* Linn., and renders it necessary to consider the taxonomic history of not only *Columbina griseola* Spix but also of *Chæmepelia griseola* Bonap. and of *Columba minuta* Linn.

Columba minuta Linn. (Syst. Nat., ed. 12, 1776, 285) was based exclusively on the *Turtur parvus fuscus americanus* Brisson (Orn., I, 1760, 116, pl. viii, fig. 2), which was poorly figured but exceedingly well described, as is attested by the rulings of modern authorities (see especially Salvadori, Brit. Mus. Cat. Bds., XXI, 1893, 481). Bonaparte, who is responsible for much that is unfortunate in ornithological nomenclature, was the first author to refer (Consp., II, 1854, 77, 78) *C. minuta* Linn. to *C. passerina* Linn., as the young of the

latter, and to refer "*C. minuta* Temm. nec Linn" to *Columbina griseola* Spix,—a wholly erroneous proceeding, by which he supplanted the well-founded *minuta* Linn. by a wholly new *griseola* Bonap. (nec Spix); for *griseola* Spix = *passerina* Linn., and *griseola* Bonap. = *minuta* Linn. Yet Bonaparte was followed in this false step by most later ornithologists, down to and including both Salvadori (1893) and Sharpe (1899). Berlepsch, however, in 1887 (Journ. f. Orn., 1887, 34), correctly identified *Columbina griseola* Spix with *Columba passerina* Linn., and this identification was emphatically confirmed by Hellmayr (Revision der Spix'schen Typen brasilianischer Vögel¹) in 1906, on the basis of an examination of Spix's original type of *griseola*, which proves to have been a young female of *passerina*, as can be readily seen by comparing such a specimen with Spix's diagnosis and plate; *passerina* being here taken in the broad sense in which it was recognized by all authors before the modern practice of recognizing slight geographic forms came into vogue. Indeed, it is only necessary to compare young or female examples of both *passerina* and *minuta* with Spix's figure and description to become convinced that Spix's *griseola* cannot be *minuta*. The wonder is, first, how Bonaparte could have made such a palpable error, and, secondly, that it could have been so long and so generally perpetuated. Linnæus, as already said, based his *Columba minuta*, fortunately, exclusively on Brisson (*l. c.*), and Brisson so well described the bird that its identity is beyond question; for the two species, *minuta* and *passerina*, are widely different at all ages. Bonaparte's *griseola* is also fully described, and is obviously the *minuta* of Linnæus, and not, as he mistakenly assumed it to be, the *griseola* of Spix. The only authors who have apparently looked up the matter for themselves, and have thus discovered the error, are Berlepsch and Hellmayr, as already stated. The case is simply one of the many instances where one author has blindly followed another, like a flock of sheep following their leader, and not a case "where doctors disagree," since *griseola* of Spix is perfectly determinable.

It is further worthy of note that Bonaparte placed *minuta* Linn. in his section "*pectore nigro undulato*" of his genus *Chamæpelia*, and *minuta* Temm. & Knip in his section "*pectore immaculato*" of the same genus, notwithstanding that Brisson's description (the sole

¹ Abhandl. d. II Kl. d. K. Akad. d. Wiss., XXII, Abt. iii, 697.

basis of *minuta* Linn.) indicates a bird with an unspotted breast, and gives other characters that absolutely exclude its reference to *passerina*. At the same time he placed *griseola* of Spix, a bird *with a spotted breast*, as shown by both Spix's figure and his diagnosis ('*plumis capitis pectorisque squamosis*'), with his own *griseola*, (described as "*subtus roseo-vinacea, pectore puro*") in the section "*pectore immaculato*"!

Now as to the summing up of the matter. The range of *Columba passerina* Linn., 1758, as originally given, included all of the warmer parts of America, and "*Picupinima, Maregr. bras. 204,*" was one of the original references. Salvadori, in 1893 (*l. c.*, 477), gave the range as "South Atlantic and Gulf States, Texas, New Mexico, Arizona, and California, south to the West Indies, and through Central America to South America, as far as Peru and Paraguay." He recognized no subspecies of it, nor any closely allied forms, and after stating that he had examined a large amount of material from a great number of localities (he lists nearly 200 specimens as being contained in the British Museum, and refers to types of alleged species and other material examined elsewhere), he says: "...I have arrived at the conclusion that there is only one species," which, he goes on to say, varies more or less according to different conditions of environment. Without having seen the type of *griseola* Spix, he placed this name under *minuta*, evidently following previous authors without careful verification of the case.

This digression is to show that the status of *griseola* was that of a synonym of *passerina* till the *passerina* group began to be recognized as an aggregation of subspecies, of which *griseola* is one. It was not till Bonaparte redescribed *griseola* in 1854 that the name figured to any extent in ornithological literature. Subsequently it was used as a substitute name for *minuta* Linn., and was generally incorrectly ascribed to Spix, as was done by Gray in 1856, in his Catalogue of Pigeons (Cat. Bds. Brit. Mus., pt. IV, 1856, 50), where he adopted Bonaparte's genera of 1854 and his wrong determination of *Columbina griseola* Spix.

We return now to the question, What shall we do with *Columbina*? To recapitulate: Gray in 1840 recognized it as a genus, with *Columba passerina* Linn. as the type, and *Chamepelia* Swains. as a synonym of it. While *C. passerina* was not one of the originally included

species, so far as the name itself is concerned, his *Columbina griseola* was really only a new name for *passerina*, as *passerina* was understood down to 1854, or for 29 years later, and at best represents only a slight geographic form of true *passerina* as at present restricted. A year later Gray recognized both *Columbina* and *Chæmepelia* as distinct genera, with *Columbina streptans* Spix as the type of *Columbina* and *Columba passerina* as the type of *Chæmepelia*, *streptans* being only *Columba picui* of Temminck renamed.

In 1854 Bonaparte retained *Chæmepelia* (emending the name to *Chamæpelia*) and proposed three other genera based wholly or in part on species originally included in *Columbina*, namely: *Talpacotia*, to include *C. cabocolo* Spix (which is *talpacoti* Temm. renamed); *Columbula*, based solely on *C. strepitans* Spix, to which he referred *Columbina* Spix as a synonym; and *Uropelia*, with *C. campestris* Spix as its sole species. *Talpacotia* is now currently treated as a synonym of *Chæmepelia*; *Columbula* is at present currently recognized as a monotypic genus, to which *Columbina* is still referred as a synonym; *Uropelia* is also still monotypic, and universally recognized. It thus happens that the four original species of *Columbina* are now dispersed among three universally recognized genera, all founded later than *Columbina* (*Chæmepelia*, 1827; *Columbula*, 1854; *Uropelia*, 1854), while *Columbina*, without adequate reason, has been retired from modern nomenclature.

The International Code of Zoölogical Nomenclature (Article 30, rule d) provides that "If a genus, without originally designated or indicated type, contains among the original species one possessing the generic name as its *specific* or *subspecific* name, either as *valid name* or *synonym*, that *species* or *subspecies* becomes *ipso facto* type of the genus." By a parallel ruling on the equal availability of species and subspecies as types of genera, the proper type of *Columbina* would be *Columba passerina* Linn. subsp. *griseola* Spix, under the trinomial refinement of modern nomenclature. *Columbina* would replace *Chæmepelia*, and *Columbula* would be left undisturbed. If *Columbina griseola* be thrown out as not available as type of *Columbina*, and Gray's second type designations for *Chæmepelia* and *Columbina* be recognized as valid, then *strepitans* would be type of *Columbina*, *Columbina* would replace *Columbula*, and *passerina* would be the type of *Chæmepelia*. But does the law of priority permit us to ignore Gray's first type designations for these two genera?

I see no reason why *Columbina griseola* Spix = *Columbina passerina griseola* (Spix), may not be properly taken as the type of *Columbina*, in accordance with rule *d* of Art. 30 of the International Code respecting the equal availability of species and subspecies as types. In the latter case the basis is type by tautonymy, in the former type by subsequent designation, where a subspecies of the species that became type by subsequent designation was the originally included form. The A. O. U. Committee on Nomenclature, however, in considering the case of *Columbina*, thought that a principle was here involved which might affect other cases, and deemed it best to refer the matter to the International Zoölogical Commission for decision — a step I heartily approve, and therefore respectfully offer the foregoing exposition as a brief on the chief points at issue.

THE DESTRUCTION OF WHISTLING SWANS (*OLOR COLUMBIANUS*) AT NIAGARA FALLS.

BY JAMES H. FLEMING.

DISASTERS that so often overtake migrating birds are seldom matters of newspaper interest, but in the present case the birds were so conspicuous and the circumstances so unusual that public interest was aroused by the account in the Buffalo papers of March 17, 1908, of a slaughter of wild swans that took place at Niagara Falls on the 15th. It was stated that 128 birds were taken out of a flock that had been swept over the Falls, and the names of several men who had made the largest bags were given. I was able to get confirmation of the story from Mr. J. S. Wallace who was in touch with friends at Niagara, and on receiving two swans and more details on the 19th, Mr. Wallace and I decided to go to Niagara Falls and get the story at first hand, and the following is as nearly a correct account as it was possible to get.

On the morning of March 14, 1908, a flock of three or four hundred swans lit in the Upper Niagara River below Grand Island

and not far from the village of Chippawa, Ont. All day detached parties of swans were seen floating down the river with the current till danger of being swept into the Canadian rapids caused the birds to rise and fly back to their starting point. They were unable to obtain food, and the constant battling with the swift current no doubt weakened them. They were still in the upper river Sunday morning the 15th. It was a day of drizzling rain. About 11.30 A. M. William Leblond, who lives at the 'Maid of the Mist' landing below the Horseshoe Falls, was on the ice bridge that then barred the river at that point. His attention being called by its cries to a swan struggling at the edge of the ice, he looked up the river towards the Falls. The water seemed covered with a struggling mass of swans that were rapidly being swept towards him. Some were caught in the Bass Rock eddy and detained near the Ontario Power Company's building, but the great majority were carried by the current directly to the ice bridge and either cast up, or ground against it, by the masses of floating ice that were continually coming over the Falls. Some of the birds were already dead, many were injured, and the rest stunned and unable to help themselves; though how any could have remained alive after coming over the falls is difficult to understand; yet many of the birds were able to call loudly in their distress. News of the disaster quickly spread and men went out on the ice bridge clubbing all the swans that could be reached, while others fished the dead and dying birds out of the water with poles, and the Italian laborers at the power works attended to all that came ashore at their point. On Monday any birds that could not be reached with clubs and poles were shot. Just how many of the flock came over the falls will never be known but after the disaster it was estimated that something under 200 birds remained on the upper river; at least 100 birds were either slaughtered or picked up between the falls and the ice bridge; some were certainly sucked under the ice and caught in the fissures of the ice bridge, and only two were taken below that point. There seems little doubt that 100 is a safe estimate of the birds taken, and all are agreed that none escaped alive, though it afterwards became apparent that many of the birds would have recovered from the shock had they been left alone, though the town of Niagara Falls would thereby have missed a gastronomic experience much to its liking, for contrary to the usual belief these swans were good eating.

We found on arriving at the Falls that Mr. Harry Schumacker had arranged interviews with some of the principal witnesses of the tragedy, and we were able to get a great deal of information from Mr. Harry Williams and Mr. Leblonde. At the latter's place we saw 30 swans hanging *en masse*. The sight was not one easily forgotten. We were within a few yards of the scene of the killing, it was late when we reached the place, and at first the swans stood out as an indistinct patch of white in the surrounding darkness, but when we were able to examine the mass with the aid of lanterns we understood the extent of the tragedy that had taken place.

On the 18th three more swans were taken; one of these was alive and was taken to the Buffalo Zoo by Mr. James Savage, where it fully recovered. Another, Mr. Leblonde told us, had taken refuge in some inaccessible place near the 'Cave of the Winds' and was still alive on the 20th.

On the 22d (Sunday) 12 more swans came over the Falls; six of these were taken at the Bass Rock eddy, and five at the ice bridge, while three were seen to rise from the water between the Falls and ice bridge and *fly back* over the Falls and on up the river.

Mr. Wallace made several subsequent visits to the Falls and cleared up some doubtful points; we were also able to compare our notes with those secured by Mr. James Savage¹ of Buffalo. Swans come over the Falls occasionally, some were taken in 1906 and 1907, but nothing like the present case is remembered by any one.

In all I saw thirty-six birds; of these I was able to secure thirty-three, resulting in a unique series of measurements, and adding to my collection all the sterna, and the skins of twenty-eight birds, while five were handed over to friends for mounting. A careful examination of the swans showed that several had broken wings, others had the clavicles dislocated, and in one or two the sternum was crushed, others had the lungs congested, but it was not possible to examine the birds as thoroughly as I would have wished. A good many of the birds showed no signs of injury except where they had been hit with clubs, or shot, and I am certain that had they been allowed time to recover from the shock they would have

¹ See Bulletin of the Buffalo Society of Natural Sciences, 1X, 1908, pp. 23-28, for a full account by Mr. Savage of this same disaster.

escaped. I found the birds with one exception fat and in excellent condition, but was disappointed to find the stomachs empty; in only three cases I found slight traces of vegetable matter. The birds had not fed since they strayed into the Niagara River. The weights varied from 11 lb. 15 oz. to 18 lb. 10 oz.; a fourth were birds of less than a year old, the remainder were fully white, and some must be very old birds. Mr. P. A. Taverner secured drawings of all the variations in the beaks. The tedious work of making up so many skins was safely accomplished by Mr. H. H. Mitchell and assistants.

THE MACAW OF DOMINICA.

BY AUSTIN HOBART CLARK,

United States Bureau of Fisheries.

SOME time ago I published ¹ an account of the Macaws which at one time inhabited the Lesser Antillean Islands of Guadeloupe and Martinique, and possibly Dominica, though I was unable to find a definite record of their occurrence in the last named. Mr. Walter Rothschild, who has recently published a magnificent work on the extinct birds of the world, was also unable to state definitely that a macaw had at any time been a resident of that island.

Through the kindness of Mr. J. H. Riley of the U. S. National Museum, who gave me the reference to the work, I am now enabled to remove the query from my previous record of a macaw from Dominica. In a book by Thomas Atwood, dated 1791², I find the

¹ The Lesser Antillean Macaws: *Auk*, Vol. XXII, No. 3, pp. 266-273, July, 1905.

² The History of the Island of Dominica, Containing a description of its situation, extent, climate, mountains, rivers, natural productions &c. &c. together with an account of the civil government, trade, laws, customs, and manners of the different inhabitants of that Island, its conquest by the French, and restoration to the British dominions. by Thomas Atwood. London: printed for J. Johnson, No. 72, St. Paul's Church-yard. MDCCXCI.

Col. H. W. Fielden and Mr. C. B. Cory both mention this work, but it was not accessible to me when I was working on West Indian birds.

following; speaking of the birds of Dominica he says (p. 29): "The mackaw is of the parrot kind, but larger than the common parrot, and makes a more disagreeable, harsh noise. They are in great plenty, as are also parrots in this island; have both of them a delightful green and yellow plumage, with a scarlet coloured fleshy substance from the ears to the root of the bill, of which colour is likewise the chief feathers of their wings and tail. They breed on the tops of the highest trees, where they feed on the berries in great numbers together; and are easily discovered by their loud chattering noise, which at a distance resembles human voices. The mackaws cannot be taught to articulate words; but the parrots of this country may, by taking pains with them when caught young. The flesh of both is eat, but being very fat, it wastes in roasting, and eats dry and insipid; for which reason, they are chiefly used to make soup of, which is accounted very nutritive."

Of course the possibility at once suggests itself that the "mackaw" is only the larger parrot of the island, *Amazona imperialis* Richmond, the "common parrot" being *Amazona bouqueti* (Bechstein); but in the former there is no red on the face, nor is it green and yellow, nor are the chief feathers of the wings and tail red; moreover, it is quite unlikely that anyone should confuse a macaw and a parrot, while it is quite probable that the two parrots were considered the same species, a misunderstanding of the specific limits of parrots being very prevalent at the present time in the tropics of the New World. There is such a great difference in life between a macaw and a parrot, while the parrots of the genus *Amazona* with which I am acquainted in the field are in general habit so similar, that I am forced to the conclusion that Atwood has considered the two parrots as one, and taken his description from the more brilliantly colored, and that his macaw is a *bona fide* member of the genus *Ara*; but it appears to be different from all the known members of the genus, and may to advantage be known by the provisional name of **Ara atwoodi**.

I take this opportunity of correcting an error which appears to have been the cause of considerable confusion; in an article on West Indian parrots,¹ I gave a list (p. 344) of all the species known to inhabit or to have inhabited those islands; those now extinct

¹ The West Indian Parrots; Auk, Vol. XXII, No. 4, pp. 337-344, October, 1905.

were referred to in a footnote, announcing the fact. By a typographical error, the reference number which should have followed *Amazona martinicana* was placed after *Amazona bouqueti*. I did not consider it necessary to call attention to this obvious slip in a special note, more particularly as nothing was said of the species being extinct in the main body of the paper (p. 343) where it is mentioned, while the name *martinicana* is here used for the first time, provisionally conferred upon a long extinct form. Count Salvadori, however,¹ in the following year, notes that "Mr. Clark mentions this species [*bouqueti*] as already extinct," and later² publishes a letter from Mr. A. H. Verrill apparently showing that the bird is rather abundant at the present time. While it is unfortunate that the mistake occurred, I cannot quite see how such a palpable typographical error could have passed unnoticed. As a matter of fact I am happy to be able to state that the bird still exists in certain parts of Dominica.

Count Salvadori is not convinced by the arguments with which I tried to show that *Amazona violaceus* (Gmelin) was near *A. imperialis* Richmond, but thrusts it back again into the synonymy of *Derophtus accipitrinus*; Mr. Rothschild has since resurrected it again, however, and I am still firmly of the opinion that it has nothing whatever to do with *Derophtus*, for the reasons I have already given. While Mr. Rothschild agrees with me on this point, I must take strong exception to several of the species of Psittacidæ he admits to the West Indian avifauna, and in this I am glad to find myself in agreement with such an eminent authority as Count Salvadori. My views on West Indian Psittacidæ remain the same as stated in my previous papers.

Mr. Rothschild appears to have overlooked my article on the West Indian Parrakeets, for he makes no reference to it in his bibliography nor in the main body of his work, nor does he mention the numerous species which have become extinct on Barbados, and several of the other islands, to which I called attention in my 'Birds of the Southern Lesser Antilles' (not mentioned by him) and in my 'Extirpated West Indian Birds.'

¹ Ibis, [8] VI, October, 1906, p. 643.

² Ibis, [9] I, April, 1907, p. 365.

GENERAL NOTES.

Cabot's Tern (*Sterna sandvicensis acuflavida*) **Breeding in North Carolina.**—In Pamlico Sound, North Carolina, about ten miles westward from the village of Ocracoke lies Royal Shoal Island. It is little more than a lump of sand and shells rearing its back scarcely three feet above high water. In area it is rather less than four acres. This island has for many years been a popular resort for breeding sea-birds. For five years the Audubon Society has protected them from the ravages of the feather hunter and egg-eating fisherman, and as a result the colony has largely increased. Laughing Gulls, Black Skimmers and Wilson's Terns breed here in numbers, and the Least Terns are perhaps more numerous about the island in summer than at any other breeding place on the Atlantic coast. The most numerous species, however, is the Royal Tern, and about 3500 young are believed to have been raised here the past season. On my last annual trip of inspection I reached Royal Shoal on June 25, 1907, and soon discovered a new bird breeding here. Closer inspection revealed the new-comer to be *Sterna sandvicensis acuflavida*. The nests of this bird, over twenty of which I counted, were merely slight excavations in the sand. These were all located among the closely clustered nests of the Royal Tern with which bird the Cabot's Tern seemed to associate constantly. Like their large neighbors, they were very tame and I easily photographed individuals at a distance of not over fifteen feet. Later in the day, by exercising patience, I crawled over the bare beach to within *seven feet* of one as it sat on its eggs, and for several minutes we observed each other at leisure. During the course of my approach the bird frequently left the nest and hovered above it but quickly settled again when my movements ceased. Warden Jannett, who guards the island, reported that sixty-four Cabot's Tern's eggs were laid during the season. This bird has not previously been noticed breeding among the protected colonies in the State, and in fact, so far as I am aware, there have been no records of its occurrence in North Carolina, except one reported by Dr. Louis B. Bishop (MS.) from Pea Island, August 22, 1904.—T. GILBERT PEARSON, Greensboro, N. C.

Lead Poisoning in Ducks.—An interesting condition of affairs, which nevertheless promises to have serious results in the future, came to my notice during the past hunting season. The Misqually Flats, one of the numerous large marshes of Puget Sound, has been famous for its duck shooting almost ever since the first settlement of the State. Many tons of shot must have been showered over its broad expanse, but until this year no harm from this source has come to any ducks that did not get it direct from a shot gun. Consequently I was surprised to discover the following conditions:—My attention was directed by a game-keeper to

the fact that he had noticed a number of Mallards (*Anas boschas*), some dead and others that appeared to be sick one day and a day or two later were found dead near the same place. Curiosity had led him to examine several, but he reported no signs of their ever having been wounded. I devoted half a day to a careful study of these singular conditions, with the result that my dog found two dead ducks and caught one that was too sick to fly away. Post-mortem examinations showed no wounds of any kind, but the three stomachs were well filled with duck shot, all evidently eaten by the birds by mistake for gravel. One stomach contained nineteen shot, one twenty-two, and the other twenty-seven. The large intestine was heavily leaded and seemed contracted, while the lining of the stomach could be easily scaled off in quite large crisp pieces. The gastric juices had evidently worked on the shot to some extent, as most of them were considerably worn and had taken various shapes. I found a number of remains of ducks that had recently been eaten by hawks or owls, but could not determine positively the cause of their death. A curious feature of the case is that all of the sick ducks found or reported were Mallards.

Has such a condition of affairs ever before been reported? If so, I should greatly like to know what the future results are apt to be.—J. H. BOWLES, Tacoma, Wash.

Capture of the Flamingo at Lake Worth, Fla.—A full grown American Flamingo (*Phœnicopterus ruber*) with very handsome plumage was killed on Lake Worth, Dade County, Fla., in May, 1905. The bird was alone, standing in shallow water, off Shermans Point, and was shot with number four shot, at about thirty yards. It was early in the day, just after a severe storm, and the bird seemed to be dazed, for while I was wading to it, it did nothing but look about, as if about to fly. The specimen is mounted and in the collection of J. J. Ryman and Son, Palm Beach, Fla.—C. P. Ryman, New York City.

The Snowy Heron in South Carolina.—On May 15, 1908, while exploring certain marshes and sea-beaches in the interest of the Charleston Museum and of the State Audubon Society, I discovered two strong breeding colonies of the Snowy Heron (*Egretta candidissima*), a species which was believed to be almost if not absolutely extinct on the South Carolina coast. The birds are established on two small islands or 'hammocks' in the salt marshes which are probably at least ten miles distant from each other 'as the crow flies,' and which are being used as breeding places by hundreds of Louisiana, Little Blue, Green, and Black-crowned Night Herons. The total heron population of the smaller hammock, which has an area of about three acres, is estimated at about six hundred, of which probably between one hundred and one hundred and fifty are Snowy Herons; while the number of herons established on the larger island,

which has an area of about four acres, is probably not less than one thousand, the number of Snowy Herons here being estimated at about two hundred.

Hundreds of nests were found in the low 'sparkleberry' bushes, yuccas and palmettoes, but owing to the close similarity of the nests, eggs and downy young of the Snowy, Louisiana, and Little Blue Herons, I was unable to determine the number of Snowy Heron nests. Many of the nests which contained eggs or downy, yellowish white young probably belonged to the Snowy, though in only one instance — when I found a Snowy dead upon a nest with one unbroken egg beneath the lifeless body — could I be sure that any particular nest was not the property of a pair of Louisianas or Little Blues. It is surprising, moreover, that we found no Snowy Herons among the nestlings which had passed beyond the downy stage. The only possible explanation seems to be that the young Louisianas and Little Blues were further advanced than the young Snowies and that the latter had not yet begun to acquire feathers at the time of my last visit on May 29. This view is supported by the fact that the testes of three adult males collected on that date for the Charleston Museum and for Mr. A. T. Wayne were very large — as I am informed by Mr. Wayne who prepared the specimens.

The Museum is taking definite measures in coöperation with the South Carolina Audubon Society to ensure the protection of these colonies. The problem of safeguarding these two little islands should not be a difficult one; and there seems to be good reason to hope that the Snowy Heron will succeed in reëstablishing itself along this coast.— HERBERT R. SASS, *The Charleston Museum, Charleston, S. C.*

The Black-crowned Night Heron in Washtenaw County, Mich.—The Black-crowned Night Heron (*Nycticorax nycticorax nævius*), although locally common south of the 42d parallel, is of rare occurrence, if one is to judge from the data at hand, in this county (Washtenaw). For that reason a statement regarding recent observations on and the capture of a specimen at Ann Arbor, Mich., will, it is believed, prove at least of interest to students of Michigan ornithology.

Previous to the appearance of the species here this spring but three authentic records were known for the county, although other specimens may have been taken by hunters and parties not in touch with students of bird-life. A brief summary of these records is as follows:—On April 30, 1882, Prof. E. D. Campbell of the University of Michigan found the species in a bit of swampy ground known locally as 'The Overflow Region,' about two and one half miles east of Ann Arbor. On June 27, 1893, Mr. P. A. Taverner noted one, apparently an immature bird, at Four Mile Lake, some four or five miles west of this city; and on April 30, 1894, observed it again in the same locality as that in which Prof. Campbell found it. Up to 1908 the above records were the only ones known to the University Museum Staff, for this County.

On May 3, 1908, it was my good fortune to observe one of these handsome birds in Forest Hill Cemetery of this city, and after watching it closely for perhaps half an hour Mr. Norman Wood of the Museum was called to the scene and verified the identification, also suggesting the possibility of a nest. Although diligent search was made for the latter, several nests apparently of the proper construction being examined, nothing was found which could positively be connected with the heron. Later in the day the bird was shot by a student, Mr. Max Peet of the University, thus preventing any further study of the bird in the field.

Laboratory examination showed the specimen to be a male, and even in the field it was readily observed that the plumage was that of an immature bird, as there was no decided black or gray about it.

Detailed examination of the skin and comparison with Audubon's excellent description at once showed the specimen to be a bird of the second year. Audubon is here quoted for the purpose of conveying a better idea of this plumage:—"Young of second year, similar to adults but scapulars and interscapulars cinereous, like the wings and the white of the forehead obscured by the blackish of the crown; the colors generally more sombre with neck and lower parts more decidedly ashy." In this specimen, besides tallying with the above, a few black feathers were found in the scapulars, showing that the bird was apparently just gaining its mature plumage. The crown plumes were three in number, pure white and of variable length, the longest being about six inches.—A. D. TINKER, *Ann Arbor, Mich.*

The Turkey Buzzard near Schenectady, N. Y.—I have been an interested reader of 'The Auk' for many years, during which time I have by degrees become educated to the fact that the Turkey Buzzard (*Cathartes aura*) has a penchant for roaming far afield. A few weeks ago I examined a stuffed specimen at the home of the owner, Mr. W. Mephan, who killed it on a Saturday afternoon in June, 1899. The bird was first observed roosting high on the dead branches of the tree from which he was shot. The bird was killed on the Toll farm situated in the town of Glenville, about three miles northwest of Schenectady. There is no question as to the authenticity of this record for the reason that I am personally acquainted with the brother of the man who killed the bird, and who was present at the time it was killed. I believe this is the most northerly record for the State.—LANGDON GIBSON, *Schenectady, N. Y.*

Migration of Hawks.—Mr. Robt. Barbour's letter in the January number of 'The Auk' (XXV, pp. 82-84) describing the migration of a large number of hawks has interested me very much. For a number of years past I have observed the migration of hawks, and have repeatedly seen, I should say, thousands of hawks. On September 22, 1907, the numbers exceeded, I believe, any ever observed before. I was on the top of a mountain near Stag Lake, Sussex County, N. J., about 1200 feet above

sea level, from where I had an unobstructed view for miles of country all around me. My object was to observe the migration of hawks, and I was armed with a Hensoldt Binocular eight power glass. The day was clear, and at one time late in the forenoon, several thousand hawks, Broadwings mostly, were in view. They came from a northeasterly direction which would take them directly to the Shawangunk Mountain, Ellenville, and Lake Minnewaska, N. Y., sixty miles northeast from my place, where a similar flight was observed by Mr. Barbour and Mr. Kirk Monroe. A constant stream of birds, very high up, could be seen for a long while, and they were going in the direction of the Delaware Water Gap. Over the valley to the southwest of me, the birds seemed to collect into an immense flock, while hundreds, if not thousands of birds were gyrating around and around, describing smaller and larger circles in the air, in heights of from, I should judge, 600 to 2,000 feet above the earth. Most birds were Broadwings. There were, however, other hawks such as Red-tails and Red-shoulders among them, while the "Accipiter" genus was represented by some Cooper's Hawks and more Sharp-shinned, which, however, were mostly flying lower and took no part in the general evolution. Some days I have observed about every species of hawks that we find in this part of the country, from the same stand. By decoying them with either a live or mechanically moving stuffed Great Horned Owl, I have taken some very successful and interesting photographs, and have secured hundreds of specimens with the gun.

Where this annual migration of hawks begins and where it ends, I do not know. If notes could be collected further north and south than Ulster County, N. Y., and Sussex County, N. J., the lane of migration might be well defined. The most extensive migrations occur just before a storm.—JUSTUS VON LINGERKE, *New York City*.

A New Name for the Texan Barred Owl.—By the changes in the names of the genera of owls lately made by the A. O. U. Committee, by which *Strix* takes the place of *Syrnium*, my name for the Texan Barred Owl becomes preoccupied, there already being a *Strix helvola* of Lichtenstein (Verz. Samml. Säugeth. und Vögeln Kaffernlande, p. 11, 1842). I therefore propose for the Texan Barred Owl, *Strix varia albogilva* nom. nov. The subspecies was originally described as *Syrnium nebulosum helveolum* Bangs, Proc. New Eng. Zool. Club, Vol. I, p. 31, March 31, 1899. The type of course remains the same, — adult ♀, No. 4551, Coll. of E. A. and O. Bangs, Corpus Christi, Texas, Feb. 2, 1899.—OUTRAM BANGS, *Boston, Mass.*

The Breeding Season of *Strix pratincola* in South Carolina.—The contribution of Mr. Arthur T. Wayne in 'The Auk' for January, 1908, concerning the breeding of the Barn Owl in South Carolina during the autumn, suggests that the following notes regarding the nesting of the bird in that State in April might be of interest.

On April 1, 1907, while the guest of Mr. William Loundes at Cat Island, South Carolina, I learned that a pair of these birds had for years inhabited a disused rice mill on his plantation. Climbing to the second floor of the building we saw a pair of Barn Owls fly out of a window, the panes of which were broken. The nest was soon located in a covered portion of the machinery. It contained four eggs. On May 20, I again visited the mill, and both old birds flew out as before. In the nest was one young owl apparently about old enough to fly. There were no eggs in the nest and nothing was seen of any other young birds. On January 23, 1908, I examined the mill thoroughly but no nest could be found and only one Barn Owl was seen.—T. GILBERT PEARSON, *Greensboro, N. C.*

Curious Fatality among Chimney Swifts.—I am indebted to Dr. O. P. Maxson, Waukegan, Ill., for information regarding the destruction of a large number of Swifts, in one of the chimneys of his house during a cold rain storm. Dr. Maxson writes under date of May 16, 1908, as follows:—

"On the 13th May there was a large flight of Chimney Swifts during a steady rain storm. One of my daughters who was out in the yard noticed the Swifts flying down into the chimney with which the furnace flue is connected, and on going into the basement we found it full of coal gas. Supposing something was wrong with the draft we investigated and then heard the birds chirping and a fluttering of wings in the chimney. There is a door in the furnace flue, about 7×18 inches, used for opening when the furnace is shut off, and through this my son and a companion reached in and took the birds out from the chimney. Some were dead, others only stupified from the effects of the heat and coal gas, while many were able to fly as soon as liberated. At first the chimney, which has a large tile-lined flue, was so obstructed by the birds as to choke the draft, and for more than an hour the boys were busy in taking out the swifts which had accumulated and were still flying in, while three of the ladies of my family were receiving them and carrying them to the open windows of the basement. There being so many at work and in such haste to get the birds into the fresh air that they might revive as many as possible, they gave up any attempt to keep count of their numbers. There were, however, one hundred and five dead and probably five times that number that revived sufficiently to enable them to fly off, when liberated. After the numbers had largely decreased in flying down the chimney and the boys had abandoned their work, I went to the flue and extricated sixty-six more, of which eight were so injured by the heat that I had to kill them. This chimney was heated by the furnace fire, but another chimney connected with the kitchen range had not been used by the birds and none were found in the ash pit at the base of it. The flight lasted from the middle of the afternoon until evening."

While it is well known that these Swifts congregate and roost in unused chimneys, particularly in the fall, prior to the migration, I think it is an

unusual occurrence for them to occupy a chimney still in use and in such numbers so early in the season. The fact that this particular chimney was one of modern construction and tile-lined, may account for the birds not being able readily to roost against the sides, and the cause of their having accumulated in a mass at its base.—RUTHVEN DEANE, *Chicago, Ill.*

The Horned Lark in Georgia.—A specimen taken from a flock of Horned Larks, January 20, 1893, at Kirkwood, Ga., by Mr. R. W. Smith has been identified at the Biological Survey as *Otocoris alpestris alpestris*, while a specimen taken in Clayton County, Ga., November 30, 1907, proves to be *Otocoris alpestris praticola*. Thus both these forms are for the first time included in the fauna of Georgia.—WELLS W. COOKE, *Biological Survey, Washington, D. C.*

Clarke's Nutcracker from Wisconsin.—On page 222 of the April issue of 'The Auk,' Mr. Widmann mentions an occurrence of *Nucifraga columbiana* in Crittenden Co., Ark., as being "the farthest eastern occurrence of the species."

In 'The Birds of Wisconsin' by L. Kumlien and N. Hollister (Bull. Wis. Nat. Hist. Soc., Vol. III, p. 86), is a notice of this species having been taken on the outskirts of the city of Milwaukee in the late fall of 1875. This carries the eastern record much beyond Arkansas.—HENRY L. WARD, *Milwaukee, Wis.*

Red Crossbills, and Some Other Birds in Lower Delaware.—On May 18, 1908, I shot an adult male, an adult female and a juv. of this species from a flock of 9 to 12 that were feeding in a pine grove close back of the village of Rehoboth, within one quarter mile of the ocean and about six miles south of Cape Henlopen. The only other record I have of this bird in Delaware is for a single bird, observed by Dr. Wm. E. Hughes, Philadelphia, Pa., near Lewes—six miles north of Rehoboth, and curiously enough that date was May 19, 1895. The dates and locality are certainly unusual for this species. Cardinals and Carolina Wrens were in full song in this same grove, an Acadian Flycatcher was noted close at hand, two Blue-gray Gnatcatchers were "bizzing" in the tree-tops, and on the 16th of May I shot a fine male Blue Grosbeak about two miles inland.—C. J. PENNOCK, *Kennett Square, Pa.*

The Nelson Sparrow in Georgia and Florida.—The Nelson Sparrow (*Ammodramus nelsoni*) was taken in 1902 by Mr. Arthur H. Helme on Cumberland Island, Ga.—the first record for the State. During the years 1905 and 1906, Mr. W. W. Worthington took the species at various places on the coast of northeastern Florida, as far south as Titusville, and the

specimens were identified by the Biological Survey — constituting the first record for Florida. During the winter of 1907-08, Mr. Helme, found the bird on the Gulf coast of Florida, south to Cedar Keys.— WELLS W. COOKE, *Biological Survey, Washington, D. C.*

The Acadian Sharp-tailed Sparrow in Georgia and Florida.— This subspecies (*Ammodramus nelsoni subvirgatus*) was found by Mr. Helme as a common winter resident at Cumberland Island, Georgia, and by Mr. Worthington as equally common at Amelia Island, Florida. In each case this is the first record for the State.— WELLS W. COOKE, *Biological Survey, Washington, D. C.*

White-crowned Sparrows Unusually Abundant in Eastern Pennsylvania.— On May 10, 1908, I noted a single White-crowned Sparrow in a small patch of briars in a fence corner one half mile from my home, and out in the country. On May 11, at 5 A. M., there were two birds in the same place. Dr. Ehinger of the State Normal School, West Chester, Pa., reports seeing two of these birds in the country on May 11, and on the same day eight White-crowned Sparrows spent the day on the campus of the Normal School.— C. J. PENNOCK, *Kennett Square, Pa.*

The Worm-eating Warbler in Ontario.— On the morning of May 28, 1908, I took a male Worm-eating Warbler (*Helmitheros vermivorus*) in a maple woods with a chestnut ridge, about three miles west of London, Ont. My attention was attracted by what seemed to be the notes of a Chipping Sparrow, delivered very rapidly but with a tone a trifle more musical than is the case with the sparrow. After some search we found him sitting still about fifty feet up, and with a glass I could see a warbler's bill and could tell that it was flesh-colored, although the light was too poor to show anything more. A lucky shot brought him down and I had the pleasure of picking up the first Worm-eating Warbler recorded for Canada.

In thinking the matter over I remembered having heard a similar, but not identical, song about a week before, ten miles further west, but was unable even to see the author of the note, and since then I have been told that this warbler was accurately described by a boy living not far from where mine was taken, so that it is possible more than one have been about. Three or four years ago Prairie Warblers were reported and taken in several places throughout the Province where they had not been seen before, and it is possible that this year may see an occurrence of Worm-eating Warblers which will parallel that of the other species.— W. E. SAUNDERS, *London, Ont.*

Protonotaria citrea at Concord, Mass.— I observed a fine full plumaged male Prothonotary Warbler at very close range in a briery swampy thicket

in Concord, Massachusetts, on May 1, 1908. This bird was identical in plumage with the one shot by Mr. Kennard in Auburndale last May, which specimen is in the Collection of the Boston Society of Natural History. The bird I saw was associated with Yellow Redpoll and Yellow Warblers and was unmistakable. Two other experienced bird students were with me.—LIDIAN E. BRIDGE, *West Medford, Mass.*

A Prothonotary Warbler in Central Park, New York City.—On May 4 of the present year I saw and identified a Prothonotary Warbler (*Protonotaria citrea*) flying back and forth over one of the inlets of the lake in Central Park. I watched it nearly an hour, many times seeing it light in a bush not four feet from where I was sitting. I pronounced it a Prothonotary Warbler, then went to the Museum and examined a skin to make sure of it. I was attracted to the bird by its song which was new to me.

On May 5, Mr. Chubb, of the Museum of Natural History, and Dr. Wiegman saw and identified it also.¹—ANNE A. CROLIUS, *New York City.*

Brewster's Warbler.—Thursday, May 14, 1908, I saw a Brewster's Warbler, a male singing, in the Arnold Arboretum near Boston, Mass. At the time he was singing the regular three-syllabled song. He is in the same part of the arboretum as last year, and is, to all appearances, the same bird.

He was seen the following day by Mr. Charles F. Faxon.—JAMES L. PETERS, *Jamaica Plain, Mass.*

The Kentucky Warbler in Vermont.—A specimen of the Kentucky Warbler (*Oporornis formosa*), was taken May 30, 1905, at Lunenburg, Vt., by Mr. W. E. Balch and identified at the Biological Survey. The specimen is now in the Fairbanks Museum at St. Johnsbury.

This is probably the first authentic record for the State.—WELLS W. COOKE, *Biological Survey, Washington, D. C.*

Mockingbird in West Medford, Mass.—From November 17, 1907, until April 20, 1908, we had a Mockingbird — *Mimus polyglottos* — on our place the greater part of each day, with few exceptions, feeding on suet, barberries and cedar berries. The bird, presumably a female, as it did not sing, scolded and drove away the Shrike, Jays, Cedar Birds and Robins.—LIDIAN E. BRIDGE, *West Medford, Mass.*

Nesting of the Short-billed Marsh Wren in Philadelphia, Pa.—The Short-billed Marsh Wren (*Cistothorus stellaris*) is of exceedingly rare occurrence in the vicinity of Philadelphia, where it is rarely seen even as a migrant,

¹[This is the bird recorded in 'Bird-Lore,' May-June, 1908, p. 128, where, however, the date of the observation is accidentally given as May 8 instead of May 4.—EDD.]

probably on account of its small size and general resemblance to its long-billed relative (*Telmatodytes palustris*), and also, quite likely, because very few of our ornithologists can distinguish it from the latter species. But it is not surprising that its identity is hard to determine, for it is more shy and retiring than the Long-billed Marsh Wren; consequently it is seldom seen and may occur and even breed in localities where its presence may be wholly unsuspected by the casual observer. Furthermore, very few ornithologists — especially the opera glass devotees — have the necessary ambition to intrude into its haunts, to wade into the swamps and marshes in quest of this and other marsh inhabiting species, and consequently there is nothing definitely known regarding its status as a resident in this vicinity.

There are no late records of its occurrence, and in the county of Philadelphia I have been unable to find a single authentic record of its capture or observation, except my own, and from this it will be seen that the Short-billed Marsh Wren can rightly be regarded as an extremely rare breeder, in North Philadelphia at least, as I have persistently and diligently searched the marshes in this part of the county annually for the past five years, but have found only one pair of birds and one nest.

This nest was found on June 8, 1904, at Richmond, Philadelphia, less than five miles from the City Hall, well within the city limits, in a large cat-tail marsh comprising over ten acres and almost surrounded by manufacturing establishments. It was well out in the marsh, amidst a dense patch of tall reeds, attached securely to the blades and stalks, $3\frac{1}{2}$ feet above water $1\frac{1}{2}$ feet deep. It contained four fresh eggs which were collected and three of them are now in the writer's collection; the fourth was accidentally broken.

The nest resembled a Long-billed Marsh Wren's in every respect. It was compactly made of dried heads of living cat-tails and marsh grass woven tightly together into an oval-shaped ball, and thickly lined with cat-tail down. It was covered with loose pieces of cat-tails, hanging from it and making it look much larger than it really was; and these pieces of rushes almost concealed the round entrance, a hole in the side, just above the middle about the size of a nickel five-cent piece. It was 7 inches long outside and 3 inches wide. There were no sham nests nearby.

The female was well seen, and she scolded vigorously while I despoiled her nest, behaving exactly like a Long-bill. The male was heard singing nearby, but was not observed, and his song differed somewhat from that of his larger relative. However, he was seen on June 14, when I made an unsuccessful search for the nest which I had left so as to induce the birds to lay the remainder of the eggs, nor could I find any other nest that I could positively identify as belonging to *Cistothorus stellaris*, although I hunted diligently. That the bird had a nest I am positive, but it was overlooked, as the marsh was a large one, with the cat-tails growing in large, dense patches.

It has been stated by some ornithologists that the nest of the Short-

billed Marsh Wren differs materially from the Longbill's domicile, and still others have said that the Short-bill does not nest over water or in company with their erratic relative. Yet the nest I found could not be distinguished by any one from a Long-bill's, and it was, as I have mentioned, over deep water and in a marsh inhabited by a large colony of Long-billed Marsh Wrens. As I found only one nest, however, I can not base any important conclusion upon it.

Further investigations by ornithologists who are not afraid of marsh wading in the vicinity of Philadelphia will no doubt lead to the discovery of the Short-billed Marsh Wren at other localities as a rare breeder, for there are many marshes and swamps along the Delaware and its tide-water tributaries that are never invaded by an ornithologist during the summer. It is a bird of local distribution everywhere, and as erratic as the Long-bill in its habits, and it may be found in the most unlooked for localities. I may mention in conclusion that there are one or two doubtful records of the nesting of the Short-billed Marsh Wren in this vicinity.—RICHARD F. MILLER, *Philadelphia, Pa.*

Breeding of the Tufted Titmouse in Washtenaw County, Michigan.—Of rare occurrence within Washtenaw County, Mich., the Tufted Titmouse (*Bæolophus bicolor*) has hitherto always been looked upon as a winter visitant. Some years, as in 1903, they have been fairly abundant, but generally speaking only an occasional one has been noted here during the months from late fall to early spring, but never as a breeding species. Mr. N. A. Wood of the University Museum has frequently stated that he believed the bird would eventually be found as a summer resident within the county.

On May 24, 1908, it was my good fortune to find a nest of this species in an extensive swamp of oak, ash, elm and maple with a tangled undergrowth of various shrubs, situated some seven or eight miles west of Ann Arbor. The discovery was one of those accidents, so to speak, that frequently occur in field-work and which lend an added charm to the study of bird-life. It came about in the following manner. While preparing to refresh the 'inner man' my ear caught the clear, whistled *peto, peto* of the Tufted Titmouse but the bird was not located until a few moments later. At that time my companion drew my attention rather suddenly to it on a rail-fence almost immediately in front of us where it appeared to be examining the half-decayed rails for insects. Presently it secured a large, white grub from one of them and with a whistle of exultation proceeded to beat and peck it about the head. Apparently becoming satisfied with its condition after that operation the bird flew off into the woods with its victim. Before its destination could be ascertained the titmouse was back again examining the trees, hanging onto the leaves and terminal twigs just like a Chickadee. Its sweet, plaintive note, *peto, peto* or *whe-o, whe-o*, was constantly in the air, coming from various parts of the wood-

land as an announcement of the whereabouts of the author. After ranging over the trees in the immediate neighborhood the titmouse returned to the rail-fence and there seemed to find much to its liking for in a short time its beak was crammed with moths and flies. Taking wing, it flew in the same direction as before, straight for the heavier part of the woods. Following rapidly after it, the nest was discovered in the dead and broken branch of a stately elm, some 50 or 60 feet from the ground. An old, abandoned woodpecker's cavity had been appropriated and filled, as far as could be ascertained through the glass, with dried grass, etc. It was utterly impossible to reach the nest without the aid of climbing-irons and of these none were at hand.

Although we waited about the vicinity of the nesting-tree for over half an hour the titmouse would not return but circled about among the surrounding trees, calling now in low whistles and then again in clear, defiant tones. Long after we had left the place we could still hear the notes. Only one bird was observed about the place and, judging from the clear coloration of the plumage and the frequent whistling, it would be safe to say that the one under observation was the male. Such being the case the female was either absent entirely from the nest or vicinity or was engaged with brooding and was being fed by her mate. The large size of the insects taken to the nest would point to the latter conclusion. Similar traits of character have been observed in the common Chickadee by Mr. N. A. Wood, and they would not be impossible in this species.—A. D. TINKER, *Ann Arbor, Mich.*

Massachusetts Records.—I have lately received for the Thoreau Museum of Natural History a female Golden Eagle (*Aquila chrysaetos*) taken by a farmer, Mr. Jacob Williams, ten miles northwest of Richmond, on November 28, 1906, and presented to this Museum by Messrs. D. P. & J. E. P. Morgan; a male American Goshawk (*Accipiter atricapillus*), taken by Mr. William Francis in January, 1908, in the Hoar Woods, Concord, Mass.; and a male Prairie Horned Lark (*Otocorys alpestris praticola*), taken by Mr. F. MacDonald Barton on February 19, 1908, on the school grounds, out of a flock of eight or ten. It seems probable that the inland flocks of Shores Larks are for the most part of this species. Though no others out of this or other flocks common here have been shot, they appear through the glass to be *praticola*.—REGINALD HEBER HOWE, Jr., *Concord, Mass.*

Early Nesting Records from Washington State.—The following personally taken records were made by me this spring in the vicinity of Tacoma, Pierce Co., Wash.

March 30th: Besides a large number of decoy nests, I found one nest of the Tule Wren containing two fresh eggs. On the same date I also found a nest of the Virginia Rail containing four eggs. The two nests were not fifty feet apart. When I went to collect these sets on April 6, I found two

more nests of Tule Wren containing eggs that were almost ready to hatch. These last two sets must have been complete on or before my previous visit.

My other early record is a nest and four eggs of the Killdeer taken April 14, that were almost one half incubated.

Of the above records it is probable that the wrens may not be greatly out of the general rule, but those of the Rail and the Killdeer I should consider most exceptional.—J. H. BOWLES, *Tacoma, Wash.*

Notes on Missouri Birds.—On examining Mr. Widmann's 'A Preliminary List of Missouri Birds' I find I have notes on several birds not reported from Missouri. At his suggestion I send them to you for a place among the 'General Notes' in 'The Auk.'

November 16, 1899, I saw a White-winged Crossbill feeding under some evergreen trees in a cemetery in town. It allowed me to stand watching it for a long time.

On Dec. 3, 1903, I saw a female Pine Grosbeak in a red cedar in a yard in town. It seemed sluggish and did not fly though I approached it closely.

In 1904 I saw Carolina Wrens in March, April, May and June, and I think it was the spring of this year that one commenced building in a gourd hanging in a lilac bush about four feet from the ground and within a few feet of our dining room window. It worked industriously for three or four days during the last week of March and then disappeared, and the House Wrens afterwards took possession of the site. This spring a pair built over a door in an outhouse in the garden and this time I think they succeeded in raising their brood, though we saw nothing of them. We could not see into the nest and the birds did not alight near it, but the male would fly to a pile of boards about thirty feet away and sing as though he would fly into pieces, and then suddenly dart towards the nest and fly through the door so swiftly that he was almost invisible. The first of May we found the nest torn to pieces. We thought the House Wrens did it.

In the spring of 1907 I saw a European Goldfinch in a pasture where American Goldfinches flock in winter and breed in summer.—M. SUSAN JOHNSON, *La Grange, Mo.*

Bird Notes from Southeastern Michigan.—'Recent Ornithological Developments in Southeastern Michigan,' by Messrs. Swales and Taverner (Auk, XXIV, p. 135), was of especial interest to me owing to its local nature, but while present conditions are faithfully depicted prior knowledge is somewhat vague, and I submit the following as additional data.

Larus delawarensis. RING-BILLED GULL.—This gull is of regular occurrence here beyond all question. I first learned to identify it in the fall of 1890, but classed it distinct from the Herring Gull as early as 1886. The first examined were two birds shot by Mr. Rad C. Ouellette, November

8, 1890, while he and I were duck hunting about three miles south of Sandwich on the Canadian side of the Detroit River. From that date I have observed it every year and in uniform numbers. It congregates about the sewer outlets along the river frontage of Detroit, being most abundant along the western portion. It is fearless and frequently comes within twenty feet of the observer. Whenever possible I have examined it through the transit telescope in the hope of discovering a Kittiwake (*Rissa tridactyla*). The ringed bill, combined with its lesser size as compared to the equally common Herring Gull, renders identification easy and further verification has come to light from time to time in the form of mounted specimens. It is abundant at times in spring, less so in fall, and a few remain all winter. During the exceptionally mild month of January, 1890, it was noted daily on the lower St. Clair River, which is all I know of it in that locality from personal observation. In February, 1892, an adult bird passed over my head in Ecorse Township, several miles inland, and none have since been seen in a similar locality during the winter months.

Sterna forsteri. FORSTER'S TERN.—The specimen recorded by Messrs. Swales and Taverner was taken on the Canadian side of the Detroit River just below Sandwich. It should be recorded for the upper Detroit River and, of course, is not a Michigan record.

Sterna caspia. CASPIAN TERN.—I have not seen this species along the Detroit River but believe numbers pass through this channel every year. The large flocks seen December 1 and 2, 1907, on the Michigan side of the St. Clair Flats were all flying across Lake St. Clair toward the Detroit River. They were in compact flocks and moving rapidly without a pause to feed.

Phalacrocorax dilophus. DOUBLE-CRESTED CORMORANT.—In March and April, 1892, to and inclusive of 1894, I spent a part of my noon hours watching the migration of water fowl from the city docks and cormorants were frequently noted, sometimes in small flocks of seven or eight but usually singly or in pairs, always passing up the river. This is the only place where I have seen them in spring. November 6, 1892, one passed my decoys off Sugar Island, lower Detroit River, and three were perched on a rocky point of Celeron Island November 12, 1903.

Chaulelasmus streperus. GADWALL.—Before the sale of game was prohibited in the State I closely watched the city markets, and despite the reputed rarity of the Gadwall four were noted there in late April, 1893; all claimed to have been taken on the St. Clair Flats. None seen elsewhere.

Spatula clypeata. SHOVELLER.—A male and two females were for sale in the city market in April, 1894, and a male in September, 1895. None seen elsewhere but several reported from the lower Detroit River. While on the subject of ducks I wish to state that none of the Scoters found their way to the city markets, though most of the old duck hunters claim to have shot them. The probable reason is the fact that Scoters are locally regarded as unfit for food.

Olor columbianus. WHISTLING SWAN.—During the last sixteen years I have personally examined nine Whistling Swans — five secured from a large flock in March, 1896, near the head of Fighting Island on the Canadian side of the Detroit River, one from the same locality taken in November, 1905, two in the city market at different times and said to have come from the St. Clair Flats, and one I found dead on the shore of Sugar Island November 6, 1892.

Olor buccinator. TRUMPETER SWAN.—One specimen in the city market in November 1893. Was taken near Wind Mill Point, Lake St. Clair, according to the statement of Thomas Swan.

Nycticorax nycticorax nævius. BLACK-CROWNED NIGHT HERON.—Though apparently rare in recent years this species was a rather common summer resident in Ecorse Township, Wayne Co., some twenty years ago and abundant at the St. Clair Flats in the early eighties. The late W. H. Collins personally informed me that he visited a breeding colony on or near Dickinson's Island consisting of about two hundred pairs. This was in 1880, if I recollect correctly. My visit was seven years later when I covered about six miles of the middle channel but failed to see a heron of this species; however, I was not nearer to Dickinson's Island than two miles nor along the channels where the birds were most liable to occur; but Mr. Collins' statement is beyond question verified, as it is, by J. H. Langille in 'Our Birds in Their Haunts.' Mr. Langille speaks of dozens at a time wheeling buzzard-like high above Dickinson's Island, and such a movement by even a few birds could not have escaped my notice; so, in all probability, the birds decreased greatly in numbers during the four years between Mr. Langille's visit and my own. The Ecorse birds were all observed on the marshes in the present village of River Rouge. They were undoubtedly all members of the same colony, as they invariably left the marshes in the same westerly direction, rising to a considerable height and crossing the open lands well above gun shot range. They were equally wary about the marshes, and the only explanation of their extermination is wholesale slaughter on their nesting grounds. The late G. J. Wood informed me they were summer residents on these marshes during his thirty years of field work in the vicinity of this city. He seldom went there in summer without meeting with the birds but spoke of them as present in small numbers only. From his account, combined with my experience, I believe these herons occurred in uniform numbers inclusive of 1888; they then became rare and the last seen by me was an immature specimen at Mr. Wood's residence in August, 1890.

Steganopus tricolor. WILSON'S PHALAROPE.—I do not consider this species of great rarity here. In 1891 John Parker claimed to have shot one the previous year on the lower Detroit River and from that time it has been reported to me occasionally from the St. Clair Flats. Mr. Walter C. Wood met with it there in June, 1900. He was rowing a boat on one of the numerous channels through the marshes on the Michigan side of the Flats

when he saw a female on some floating vegetation near the channel margin. It was very tame. He stopped the boat and watched it for some time at less than ten yards, then passed on without alarming it to flight. In June, 1904, Jesse T. Craven and party met with this phalarope in practically the same portion of the Flats, and under circumstances that convinced them the birds were breeding. In 1889 the late W. H. Collins told me that he found phalaropes in summer on the Flats, and I believe that at least a pair or so still summer there and probably breed. I made no attempt to find the Wilson's Phalarope here in Wayne County until 1907 when I decided to take a pair if possible, and secured a male and female May 19 on P. C. 667, Ecorse Twp. This was the first and only day I looked for them.

Actodromas fuscicollis. WHITE-RUMPED SANDPIPER.—The status of this sandpiper in the State has been discussed but I wish to add that Mr. Herbert H. Spicer and myself again found the species common in 1907 and secured specimens. The first appeared May 26 on P. C. 667, Ecorse Twp. We found it impossible to make an exact count but estimated the number of individuals seen as fifty. During the remainder of the month and early June we found them present on all visits and the last seen was a flock of fourteen, June 6, on P. C. 588, City of Detroit.

Charadrius dominicus. GOLDEN PLOVER.—In early May, 1894, a string of about two dozen Golden Plover were for sale in the city market. I examined these birds and am positive as to identity. Sometimes, numbers were on sale in autumn but I now believe the majority of these were the Black-bellied Plover, and the uncertainty destroys all scientific value.—J. CLAIRE WOOD, *Detroit, Mich.*

Four Rare Birds in Southeastern Michigan.—The past spring in this section was made interesting by the capture of four rare birds in the vicinity of Detroit. These were all brought into Mr. Arthur Borck's taxidermy establishment where, through the courtesy of the proprietor, I was enabled to examine them in the flesh and secure one for my collection.

YELLOW RAIL, *Porzana noveboracensis*.—A female was caught alive by a dog March 25, north of and just beyond the city limits. Another bird of the same kind was said to have been flushed immediately afterwards but could not be secured. The one taken was presented to me. I endeavored to keep it alive but without success. It refused to eat and grew so weak that I had to kill it and make it up into a skin. It is No. 1028 in my cabinet.

CASPIAN TERN, *Sterna caspia*.—The writer, in collaboration with Mr. B. H. Swales, presented the known status of this bird to 'The Auk' readers a short time ago (Auk, 1907, XXIV, 137). It pleases me to be able to state that the required absolute data of the bird's occurrence near this city has been obtained. April 26, I examined a bird taken the day before at Hooker's Point, Lake St. Clair. Two were said to have been shot, though but one was brought in to be mounted.

BARTRAMIAN SANDPIPER, *Bartramia longicauda*.—This bird had been deemed extinct in the County for some years. May 3, however, one bird was taken by some trap shooters just outside the northern limits of this city. It rose from the grass where they were shooting and flew around the traps several times until one of the shooters dropped it. None others were seen.

AMERICAN WHITE PELICAN, *Pelecanus erythrorhynchos*.—May 29, a fine and seemingly adult bird of this species was killed near Strawberry Island, St. Clair Flats, by Mr. Frank Meloche. As far as I was able to find out it was the only one seen.

I may add further that a Pine Siskin (*Spinus pinus*) was taken on May 19, 1908, on Grosse Isle, in the lower Detroit River. It was a male, with poorly developed testes, showing no signs of immediate breeding. This species has been reported from adjoining Ohio stations, and hypothetically from Point Pelee, Ontario, at like seasons of the year, but this is the first specimen taken, to my knowledge, in Wayne County.—P. A. TAVERNER, *Highland Park, Mich.*

Wilson's Phalarope and White-rumped Sandpipers in Wayne Co., Mich.
—WILSON'S PHALAROPE, *Steganopus tricolor*.—May 9, 1908, I had the pleasure of taking another Phalarope of this species in the same mud-hole in Ecorse Twp., Wayne Co., Mich., in which my previous record was made (Auk, XXIII, 1906, 335). It proved to be a female and was the only one seen.

WHITE-RUMPED SANDPIPER, *Actodromas fuscicollis*.—May 23, 1908, six were observed and two taken by myself in the same locality as above.—P. A. TAVERNER, *Highland Park, Mich.*

Two Ontario Records.—BLUE-WINGED WARBLER, *Helminthophila pinus*. September 2, 1906, I took a juvenile bird of indeterminate sex from a grape vine tangle, near the end of Point Pelee, Ontario. This forms, I believe, the primal record for the species in Canada. The next day another bird, supposed to be the same, was shot but could not be found in the thicket.

TURKEY BUZZARD, *Cathartes aura*.—April 24, 1908, I received a bird of this species in the flesh from Point Pelee, Ontario. It was perfectly fresh and could not have been killed more than a couple of days. On dissection it proved to be a female with ovaries considerably enlarged. We have had reports of this bird's breeding near Harrow, about eighteen miles west of the Point, and have seen birds on Point Pelee itself May 20, 1906 (Willson Bull., 1907, 91).—P. A. TAVERNER, *Highland Park, Mich.*

RECENT LITERATURE.

Walter on Bird Migration.¹—After presenting several pages of general comment, the author proceeds to treat of bird migration under the two questions, "I. How do Birds find their way in Migration?" and "II. Why do Birds migrate?" under which he reviews, in the main to condemn, various theories that have been put forth in answer, and announces as his 'conclusion': "There still remains an immense halo of mystery around bird migration because there are so many things we do not know. We not only do not know *why* birds migrate but as yet we do not know *how* they migrate except in a general way."

Under the first question he properly condemns the "instinct theory" as a confession of ignorance. The "magnetism theory" of von Midden-dorff and the "semicircular canal theory" of Mach-Bruer are both found wanting, the latter having been thoroughly refuted by the experiments of Exner upon pigeons. He deals a little more kindly with the "sense of direction theory," but as it lacks the demonstration of a "physical basis," he deems it "is hardly better than the instinct theory since it gives the answer to the problem in unknown terms."

The "landmark theory," he states, has rather more to recommend it. Thus, he says: "Exner came to the conclusion that carrier pigeons find their way home by seeing familiar landmarks and when such landmarks are not visible the birds explore until landmarks are found. This explains how his pigeons, whether whirled, galvanized or narcotized, were quite as well able to get home as those which had not undergone such interference with their sensory impressions upon the outward journey." But he adds: "The objection must be raised to the landmark theory, however, that many birds do not follow river valleys, coast lines or mountain chains in the way they might be expected to do if they were guided by what appear to us to be the most obvious landmarks." It does not follow, however, that because birds do not always follow river valleys or mountain chains, but pursue courses more or less divergent from them, that they do not serve them as landmarks for their journeys. The recognition of such landmarks would be sufficient for their guidance whether their lines of migration are parallel or more or less oblique to the general trend of mountain ranges or river valleys.

He concludes that in the case of carrier pigeons "the successful individuals are those who have been trained over the course, that is, those who have learned the way either by seeing landmarks for themselves or by following a trained companion. There is no mysterious sixth sense of direction, no crossing of imaginary magnetic lines, no intricate automatic

¹Theories of Bird Migration. By Hubert Eugene Walter, Ph. D., Brown University. Reprinted from 'School Science and Mathematics,' April-May, 1908. 8vo., 16 pp., *without pagination*.

registry of distance and direction by means of the semicircular canals. It is simply a case of a home-loving animal away from home putting its wits and senses and experiences together to get back to its home and in this case these known resources are sufficient for the task. Why may not this also," he reasonably asks, "be the true explanation of the manner in which birds find their way on those greater pilgrimages we call migration?"

The "follow-the-leader theory" is accorded "a large element of probability," for which he argues at considerable length. Thus he concedes that "it seems reasonable to believe that the manner in which it [migration] is carried out, the way in which the path is followed, may find an adequate explanation in the temporary leadership of some individual within sight or hearing of the others, who knows at least a fraction of the way by experience or who strikes out a safe path by means of landmarks."

Under the second question "Why do Birds migrate?" various hypotheses are weighed, only to be found wanting. Decrease of temperature does not satisfactorily explain fall migration, because "the fall migration is largely completed before the weather becomes cold"; but scarcity of food, dependent upon the low temperature of winter, is admittedly an important factor.

The "premonition theory" of Brehm, which, he says, "at first thought seems entirely fanciful," in reality "contains a large element of probability," since by virtue of their peculiar anatomical structure — large lungs, pneumatic bones, and internal air sacs — they "are, to a remarkable degree, living barometers, responding with great delicacy to changes in barometric pressure." Yet "that birds can anticipate winter and as a result make an effort to avoid its disastrous effects, is beyond demonstration and seems quite unlikely."

The "short day theory" also "suffers, as does many another, because of a few obtrusive incontrovertible facts," as "the migration south begins before the days are perceptibly shorter." In reality, however, this is hardly true, even in the far north, whatever there may be in the theory.

In this connection he again recurs to the "food supply theory," to which he objects on the ground that "it must be admitted that a large per cent. of migrating species leave for the south in the very height of the seed and insect harvest." Yet, he adds, "upon the ground of food supply, natural selection would promptly eliminate those who did not go south and would tend at the same time to favor the perpetuation of those who varied in the direction of southern migratory habits, whatever the cause of those variations might be." What he intends the reader to infer from these statements as to his position on the "food supply theory" is not very clear.

The author now proceeds to consider the theories to account for the spring migration, giving attention first to "the instinct theory," of which he says: "That it is a bird's *instinct* to go north in the spring is no better an explanation of the origin of migration than it is of how a bird finds its way during migration" — a truism no one will question. Then are taken

up in turn "the homesick theory," "the desire to disperse theory," "the nestling food theory," "the safe nesting theory," all of which are given short shrift, mostly with reason. Some half-dozen "ancestral-habit" theories are also cited and summarized. Many of the postulates attributed to the authors mentioned did not, however, originate with them nor at the dates implied, but were of much earlier origin and in a measure common property long before the implied dates. The principal factor put forward by Marek in 1906, that of the influence of barometric pressure — birds migrating from areas of high barometric pressure to areas of low barometric pressure — was stated in substance, and nearly in the same terms, by Cooke a dozen years before; and so with the main points of other recent theories here summarized, some of which were brought out by American writers twenty years before the implied date of origin here given. This is not said in disparagement of the later authors cited by Mr. Walter. For example, Marek's explanations of how and why birds migrate is based on his own independent and extended original investigations of the movements of birds in Europe, and is none the less interesting and valuable because it is in the main confirmatory of earlier investigations and conclusions made elsewhere, and for many years more or less generally accepted by those who are best acquainted with the real facts of migration. Thus, Walter says: "From his [Marek's] point of view there is no necessity for referring the habit of migration to hypothetical ancestral behavior, nor for endowing birds with such human attributes as love of home or the memory of previous successes. The streaming northward of birds in the spring and their return southward in the fall are both primarily dependent upon the same observable external factors as those which cause the flow of the air in the form of prevailing winds, northward in the spring and southward in the fall."

While no facts in relation to the habits and behavior of animals are in the main better established than the above, Mr. Walter is able to see only "an immense halo of mystery around bird migration." This is perhaps due to his having overlooked a principle of prime importance, or to which at least there is no allusion in his very interesting summary of the subject. This is the intimate interrelation of the impulse of migration and the function of reproduction. As we stated the case some fifteen years ago: "If we consider that migration consists really of two movements — that is from the breeding station to the winter quarters and then back again — and that the one movement is the necessary complement of the other, it is hardly necessary to seek for a separate cause for the two movements; the two together constitute migration in a complete sense, which, as already explained, is an inherited habit,— an inherent, irresistible impulse, closely blended with the function of reproduction. The promptings which lead to the migratory movement, respectively in fall and spring, have unquestionably a different origin; the autumnal movement being doubtless [at least primarily] prompted by a reduction of temperature and

a failing food supply, while the spring movement is incited by the periodic activity of the reproductive organs, resulting in the necessity for the return of the species to the peculiar conditions and surroundings to which for long ages it has been undergoing special adaptation — in other words, to its home."¹ This is not, however, necessarily the place of origin of the species, which, in the case of many of our Warblers, Tanagers, Flycatchers, etc., may well have been within tropical latitudes, which are now merely their winter resort and not their *home* or place of reproduction.

In the discussion of migration the great fundamental fact that the life of animals, and especially of migratory animals like birds, is made up of annual cycles, as is the life of plants, which have their fixed and determinate seasons for flowering and fruiting, is generally overlooked. Attention was long since directed to this factor by Chapman, but it seems not to have received the attention to which it is entitled. After referring to the fact that many animals manifest a desire for seclusion during the period of reproduction, and that "many species of tropical sea-birds resort each year to some rocky islet, situated perhaps in the heart of their habitat, where they may nest in safety," he continues: "This is not migration in the true sense of the word, but nevertheless the object is the same as that which prompts a Plover to migrate to the Arctic regions, and, be it noted, is just as regular. . . . As in the case of a Warbler which nests in Labrador, they are all affected at nearly the same time by an impulse which urges them to a certain place. This impulse is periodic and is common to all birds. . . . It is evident, therefore, that external conditions have not created this impulse, though it is possible that in many instances they may have governed its periodicity. On the contrary, its causes are internal. In the case of the sea-birds, for example, dissection will show an enlargement of the sexual organs and it is this physiological change which warns the birds that the season of reproduction is at hand."² And, it may be added, prompts them to seek their accustomed breeding resorts, be they nearby rocky islets or remote arctic or subarctic latitudes. We have here the key to the impulse of the spring migration, of which the return migration in the fall is the necessary complement, inasmuch as in most instances the winter conditions of the breeding grounds of most species are prohibitive of their continued residence therein throughout the year.

How they find their way in their migrations is certainly remarkable and implies wonderful gifts of which we have no intimate knowledge, but enough, it would seem, fairly to remove the subject from the realms of that complete mystery so many writers seem to take pleasure in involving it. In addition to keen powers of vision and a retentive memory, which together enable them to distinguish landmarks, and a remarkable sensitiveness to meteorologic conditions, they may also possess a, to us, mysterious sense of direction, as shown by the recent experiments of Dr. J. B. Watson with Noddies and Sooty Terns. Dr. Alfred G. Mayer, Direc-

¹ Auk, X, 1893, p. 104.

² Auk, XI, pp. 13, 14.

tor of the Department of Marine Biology of the Carnegie Institution of Washington, in his annual report for 1907, states, in reference to the work of Prof. John B. Watson of Chicago University on the behavior of Noddy and Sooty Terns, that "Among other things, he demonstrated that if sooty terns and noddies were taken to Cape Hatteras and there liberated they would return to their nests on Bird Key, Tortugas, a distance of 850 statute miles from their place of liberation." Prof. Watson's full report on these experiments has not yet appeared, but Mr. Chapman gives some of the details and comments on the matter in 'Bird-Lore' for May-June, 1908 (p. 134) as follows:

"We have before referred to the studies of Noddies and Sooty Terns by Prof. John B. Watson on Bird Key, Tortugas, during the nesting season of 1908, and in the annual report of Dr. Alfred G. Mayer, Director of the Department of Marine Biology of the Carnegie Institution, under the auspices of which Professor Watson's researches were made, there appears a preliminary report of this work. The final report will appear during the year, and we will call attention here, therefore, only to Professor Watson's supremely interesting tests of the homing instincts of Noddies and Sooty Terns. Fifteen marked birds were taken from the Key and released at distances varying from about 20 to 850 statute miles, thirteen of them returning to the Key. Among these thirteen were several birds which were taken by steamer as far north as Cape Hatteras before being freed.

"This experiment is by far the most important in its bearing on bird migration of any with which we are familiar. It was made under ideal conditions. Neither the Noddy nor Sooty Tern range, as a rule, north of the Florida Keys. There is no probability, therefore, that the individuals released had ever been over the route before, and, for the same reason, they could not have availed themselves of the experience or example of migrating individuals of their own species; nor, since the birds were doubtless released in June or July, was there any marked southward movement in the line of which they might follow. Even had there been such a movement, it is not probable that it would have taken the birds southwest to the Florida Keys, and thence west to the Tortugas. This marked change in direction, occasioned by the water course, which the birds' feeding habits forced them to take, removes the direction of the wind as a guiding agency, while the absence of landmarks over the greater portion of the journey, makes it improbable that sight was of service in finding the way. Professor Watson presents, as yet, no conclusions, but, while awaiting with interest his final report, we cannot but feel that his experiments with these birds constitute the strongest argument for the existence of a sense of direction as yet derived from the study of birds. With this established, the so-called mystery of migration becomes no more a mystery than any other instinctive functional activity."—J. A. A.

Cherrie on Trinidad Birds.¹—As the result of a month's collecting, in March, 1907, in which time 300 specimens, representing 96 species, were collected by him, Mr. Cherrie records five species as new to the list of Trinidad birds. One of these species, *Chatura cinereicauda*, is erroneously given, having been previously collected and recorded by Mr. F. M. Chapman. Furthermore, the specimens on which the latter record is based, and with which Mr. Cherrie's bird will doubtless be found to agree, prove to be not the true *cinereicauda* but a new species which Dr. Hellmayr has recently described as *Chatura chapmani*.

Of the remaining four species, two had previously been taken on the small island of Monos, only a few hundred yards from Trinidad and, as Mr. Cherrie remarks, so close to the larger island that birds of the weakest flight might readily pass back and forth.

Catharus melpomene costaricensis and *Leptopogon superciliaris*, represent genera as well as species entirely new to Trinidad, and have never been taken on the neighboring small islands.

The Trinidad *Megarhynchus* which Mr. Cherrie recently proposed to call *M. pitangua parvirostris* is now considered doubtfully separable, on account of the variation in size of bill found among the continental birds.

This list is annotated with remarks on abundance, and exact localities and dates of many specimens are given. The colors of the changeable parts of many species are recorded, and there are also interesting notes on habits, song and nesting.—W. DEW. M.

Bangs 'On Certain Costa Rican Birds.'²—In this paper, based mainly on collections made by C. F. Underwood, the following seven new forms are described: *Trogon underwoodi*, *Pachyrhamphus versicolor costaricensis*, *Myiobius xanthopygus aureatus*, *Troglodytes ochracea ligea*, *Myioborus aurantiacus acceptus*, *Phlogothraupis sanguinolenta aprica* and *Emberizoides sphenura lucaris*.

Mr. Bangs remarks that the characters of several of these forms have already been pointed out by Ridgway in his 'Birds of North and Middle America,' and more ample material has convinced the describer of the desirability of providing them with names.

Additional specimens of *Chlorospingus zeledoni* and *Thryorchilus ridgwayi* confirm the standing of these local species. Cassin's name *bryanti* is taken up for the Costa Rican subspecies of *Spinus xanthogaster*, which of late years has not been recognized as distinct, and a hummingbird, *Lophornis delatirii*, is recorded for the first time from Costa Rica.

Mr. Bangs' material also enables him to clear up the confusion that has existed concerning the Costa Rican swifts. In addition to *C. gaumeri* and

¹ On a Second Small Collection of Birds from the Island of Trinidad. By George K. Cherrie. Science Bulletin, Museum of the Brooklyn Institute of Arts and Sciences, Vol. I, No. 13. Published March, 1908.

² On Certain Costa Rican Birds. By Outram Bangs. Proceedings of the New England Zoölogical Club, Vol. IV, pp. 23-35. March 19, 1908.

C. vauxi, two distinct species of *Chatura* are recognized, *C. cinereiventris phaeopygos* and *C. spinicauda fumosa*.—W. DEW. M.

'**Cassinia.**'—'Cassinia, A Bird Annual,'¹ "devoted to the ornithology of Pennsylvania, New Jersey, and Delaware," comprises seven papers, followed by an 'Abstract of Proceedings,' a bibliography (including (1) ornithological papers for 1907 by members of the Club, and (2) additional papers relating to the birds of Pennsylvania, New Jersey and Delaware), a list of the members of the Club, and an index. The place of honor is accorded to Witmer Stone's interesting biographical sketch of Adolphus L. Heermann, M. D., who was born, it is supposed, in South Carolina in 1818, and who died at San Antonio, Texas, September 2, 1865. Dr. Heermann is well known as one of the naturalists of the Pacific Railroad Surveys, he having been surgeon and naturalist to Lieutenant R. S. Williamson's expedition, in 1853-54. Previously Heermann had made a large collection of birds in California, and is further known to bird students through the names of two species of California birds, a gull and a sparrow, dedicated to him by Cassin. Mr. Stone has been unable to present a very detailed or connected history of his life, but the facts here brought together are most welcome. The accompanying portrait of Heermann is from a daguerreotype and represents him as attired on one of his western expeditions. The titles of the other papers are: 'Some Birds of Brown's Mills, N. J.,' by Cornelius Weygant; 'Type Birds of Eastern Pennsylvania and New Jersey,' by Spencer Trotter,—an interesting list, with comment, of species first made known from birds obtained in this region; 'Bird Life of the Indian River Country of Delaware,' by Charles J. Pennoek; 'A Pensauken Diary,' by Chreswell J. Hunt (with two half-tone plates); 'Report on the Spring Migration of 1907,' compiled by Witmer Stone (pp. 54-79). The average attendance at the sixteen meetings of the Club held during the year was 24, with a maximum attendance on one or more occasions of 51.—J. A. A.

Beebe on the Seasonal Changes of Color in Birds.²—The investigations here reported relate to the Scarlet Tanager and the Bobolink. Birds of each species in full nuptial plumage and still in the height of vocal and physical conditions were placed in small cages in a quiet room, and the supply of light gradually cut off and the amount of food increased. When the time for the autumnal moult arrived not a single feather was shed. "In brief, the birds skipped the fall moult entirely and appeared to suffer no inconvenience whatever as a result." They showed only the symptoms of inactivity produced by excessive fatness; early in the experiment they

¹ Cassinia, A Bird Annual. Proceedings of the Delaware Valley Ornithological Club of Philadelphia, 1907. Issued March, 1908. 8vo, pp. 98, and 3 half-tone plates. Price, 50 cents.

² Preliminary Report on an Investigation of the Seasonal Changes of Color in Birds. By C. William Beebe. American Naturalist, Vol. XLII, Jan. 1908, pp. 34-38.

ceased to sing, and after a good layer of fat had been acquired they seldom uttered even a chirp. Early in the following spring the birds were placed under normal conditions, and they soon moulted into the condition appropriate to the season; in other words, they moulted immediately into the nuptial plumage, the autumn moult and the dull plumage of winter having been completely omitted. "I think we thus have proof," says Mr. Beebe, "that the sequence of plumage in these birds is not in any way predestined through inheritance bringing about an unchangeable succession, in the case of the Tanager, of scarlet — green, scarlet — green, year after year, but that it may be interrupted by certain external factors in the environmental complex." These interesting results could not have been foreseen, and we await with interest the result of Mr. Beebe's further experiments along these lines.— J. A. A.

Contributions to Philippine Ornithology.—No. 5 of Vol. II (October, 1907) of the 'Philippine Journal of Science' contains 14 papers on Philippine birds, of which 9 are by Richard C. McGregor, 2 by Dean C. Worcester, 2 by Dr. Edgar A. Mearns, and 1 by Dr. R. W. Shufeldt (noticed *antea*, p. 245). These vary in length from a note on a single species to a list of the species of an entire island, as follows: 'On a Nesting Specimen of *Caprimulgus griseatus* Walden,' by D. C. Worcester, pp. 271-273, with 2 half-tone plates; 'On a Nesting Place [Didikas Rocks] of *Sula sula* (Linn.) and *Sterna anæstha* Scopoli,' by D. C. Worcester, p. 175, and 1 half-tone plate; 'Notes on a Collection of Birds from the Island of Basilan, with Descriptions of three new Species,' pp. 279-291, by R. C. McGregor — 151 species, 29 here for the first time recorded; 'Descriptions of four new Philippine Birds,' by R. C. McGregor, pp. 292-294; 'The Occurrence of Blythe's Wattled Lapwing and Scaup Duck in the Philippines,' by R. C. McGregor, p. 295; 'Notes on a Bird unrecorded from Mindanao,' by R. C. McGregor, p. 296 — *Rhaldornis inornata* Grant; 'Notes on [three] Specimens of Monkey-eating Eagle (*Pitheophaga jefferi* Grant) from Mindanao and Luzon,' by R. C. McGregor, p. 297; 'Notes on Birds collected in Cebu,' by R. C. McGregor, pp. 298-309 — 149 species, 24 previously unrecorded; 'Birds observed in Bantayau Island, Province of Cebu,' by R. C. McGregor, pp. 310-314 — 66 species; 'The Birds of Bohol' by R. C. McGregor, pp. 315-333, and a half-tone plate of *Circus melanoleucus* — 145 species, 91 here first recorded, 2 new; 'The Birds of Batan, Camiguin, Y'Ami, and Babuyan Claro, Islands north of Luzon,' by R. C. McGregor, pp. 337-349 and 5 half-tone plates — 78 species, 1 genus and 7 species described as new; 'Two Additions to the Avifauna of the Philippines,' by E. A. Mearns, p. 353 — *Butorides spodiogaster* (Sharpe) and *Spodiop-sar cineraceus* (Temm.); 'Description of a new Genus [*Malindangia*] and nine new Species of Philippine Birds,' by E. A. Mearns, pp. 355-360 — with a key to the Philippine species of *Merula*.

As indicated by the titles and comment, these papers form an important contribution to Philippine ornithology.— J. A. A.

Menegaux on the Birds of the French Antarctic Expedition.¹—The birds included in this report number 23 species, of which only 21 are Antarctic. Sixteen are represented by specimens — 150 skins, besides many eggs, and eggs and young preserved in alcohol for anatomical and embryological study. Most of the species are treated at considerable length, with special reference to their habits and seasons of migration, moult, etc. The account of the 'Papou' (*Pygoscelis papua*), occupies ten pages and summarizes, apparently, all that is known of its life history. The account is decidedly 'humanized,' but is none the less entertaining and interesting. The other Penguins, the single species each of Cormorant, Gull, Tern, and the Giant Skua, are also treated in a similar way, but at less length.

For the Penguins the author prefers the French vernacular name 'Manchot' to that of 'Pinguin,' on the ground that the latter was given originally to the Alcæ of the northern hemisphere and later extended to the Penguins of the Antarctic. When Brisson, in 1760, separated the two groups he applied the term Manchot to the Spheniceidæ and restricted the term Pinguin to certain members of the Alcidae, which distinction was later adopted by Buffon, but almost uniformly disregarded by later authors. While the proposed change is proper, it will doubtless be as hard to establish as it is to eradicate other misnomers that have acquired almost universal usage.

The first of the thirteen plates is a map of the distribution of the 'rookeries' of Manchots, Cormorants and Skuas to the west and north of Graham Land, which are mostly, in this district, on the small islands to the westward of Graham Land. The remaining twelve are made up of 43 half-tone reproductions of photographs taken at the bird rookeries, fifteen of which are from Charcot's "Le 'Français' au Pole Sud," from which many extracts are also given on the habits of the birds observed by the Expedition. These figures are all duly cited in the text, but the legends on the plates and in the 'Explication des planches' fail to indicate the species or the localities represented.— J. A. A.

Reichenow on Sea-Birds.—Dr. Reichenow's valuable memoir² consists of two parts, the first treating of the 'Vögel des Weltmeeres' (pp. 437-535), and the other the 'Vögel des Südpolargebiet's' (pp. 536-567). Here only the Sea-birds of the eastern hemisphere are considered, leaving for a future memoir those of the western hemisphere.

The first ten pages of the first part contain a general account of the distribution of the principal groups and prominent species, with a short list of papers and works relating to the subject. This is followed by a systema-

¹ Expédition Antarctique Française (1903-1905), commandée par le Dr. Jean Charcot. Sciences naturelles: Documents scientifiques. Oiseaux. Par A. Menegaux. 4to, pp. 1-79, pll. i-xiii. No date.

² Vogel des Weltmeers | Die Meeresvögel der östlichen Erdhälfte | Von Ant. Reichenow | (Berlin) | Zeichnungen von G. Krause | Mit Tafel XLV-L | und 32 Abbildungen im Text — From 'Deutsche Südpolar-Expedition 1901-1903,' Bd. X. Zoologie, I, pp. 435-567, pll. xlv-l, 33 figures in text, and a South Polar chart.

tic review of the species, with keys to the higher groups, genera, and species, short descriptions of the latter, and brief indications of their breeding areas and winter ranges, the species treated numbering 144. On the accompanying map the ranges of various genera, and of some of the species, are graphically represented, as well as the boundaries of the three distribution areas briefly outlined in the text. The text illustrations and the five plates furnish characteristic representations of the greater part of the species mentioned in the text.

The second part deals especially, and in much greater detail, with the birds of the South Polar regions, 54 in number. The boundaries of the region considered are given on a map (p. 541), together with the northern limit of the south polar distribution zone, of the pack-ice, and of icebergs. There is also an important bibliography of the subject, with very full bibliographic references under each species, and the distribution of each species is treated in great detail. The work is thus an important contribution to the ornithology of the south polar regions, and a summary of present knowledge of the oceanic distribution of bird life.—J. A. A.

Godman's 'Monograph of the Petrels.' The second installment¹ of this important work concludes the genus *Cymodroma* and includes the genus *Puffinus*,—25 species in all, of which 20 are figured. In general character it of course conforms to Part I, already noticed, the history of each species being given at considerable length, and its relationships and nomenclature duly considered. The plates maintain the same high degree of excellence.

The following technical points may be here mentioned as of some interest. The genus *Cymodroma* Ridgway, 1884, is antedated by *Fregetta* Bonaparte, 1854, both with the same type by original designation. The only objection to *Fregetta* is that there is an earlier *Fregatta* (Lacépède, 1799), based on the Frigate Birds, but the names are too unlike to involve confusion.²

Puffinus borealis Cory is considered as not separable from *P. kuhli*, although American writers (perhaps mistakenly) regard them as specifically distinct. Hartert recognizes (Nov. Zool., II, 1905, 97) the form of *P. kuhli* from the Azores and Madeira as subspecifically different, under the name *Puffinus kuhli flavirostris* (Gould), but Dr. Godman says that after having examined the specimens in the Rothschild and British Museums he is "driven to the conclusion that a perfect gradation exists," and that he follows "Salvin in uniting the two races"; failing to recognize the fact that 'races,' or 'subspecies,' are expected to show intergradation. But it seems that Dr. Godman is one of the few ornithologists who are

¹ Part II, pages 59–152, plates xx–xxxix. March, 1908. For notice of Part I, see *antea*, p. 244.

² Cf. Coues, Auk, XIV, 1897, 315; A. O. U. Committee, Auk, XVI, 1899, 102; Sharpe, Hand-List of Birds, I, 1899, 122; Salvadori, Bull. Brit. Orn. Club, No. CXLII, April, 1908, 79, footnote; Richenow, Vögel des Weltmeeres, 1908.

still unable to see any advantage in the recognition of subspecies; and hence it may be here noted that in the present work the subspecies of modern authors are either wholly ignored in nomenclature or are given the rank of full species. Also that tautonymy is distasteful to the author of the 'Monograph of the Petrels,' and we have *Puffinus anglorum* as a substitute for the now almost universally accepted *Puffinus puffinus*; and, of course, consistently with this mental attitude, the beginning of binomial nomenclature in zoölogy is based on the 12th instead of the 10th edition of Linnæus's 'Systema Naturæ.'

Puffinus auduboni Finsch is preferred as the name of Audubon's Shearwater, on the ground that the earlier name *Puffinus lherminieri* Lesson rests on a diagnosis "too general in character." Yet *Puffinus bailloni* is tentatively accepted for the Madeiran Shearwater, although the original diagnosis is even less satisfactory, and there is also doubt as to whether the species really occurs at the type locality given for it by its author. Although Hartert has employed this name for the Madeiran species (as *P. obscurus bailloni*), he admits that possibly it should have a new designation, an opinion to which Godman unreservedly assents. The case thus seems so clear that we propose for this species the name *Puffinus godmani*, as a slight compliment to the distinguished author of the 'Monograph of the Petrels.'

While vernacular names are not subject to the same rules as technical names, it seems well to avoid their double employ as far as possible, and especially for such nearly related birds as those of the same genus. It was probably through oversight that in the present 'Monograph' the name Pink-footed Shearwater is used for both *Puffinus creatopus* (p. 101) and *P. carneipes* (p. 142).—J. A. A.

Howard's 'The British Warblers,' Parts I and II.¹—This remarkable work is worthy of the highest praise, as regards both conception and execution. The numerous and beautiful plates are a fitting complement to the text, which together will mark an epoch in the history of this most interesting group of British birds. The account of each species is a detailed and elaborate monograph of its life history, with digressions, as expressed in the subtitle, on the "problems of their lives," based evidently on intimate first-hand knowledge of the bird in life. The treatment of these 'problems' is sane and rational in marked contrast with much that has of

¹ The | British Warblers | A History with Problems | of | their Lives. By | H. Eliot Howard, F. Z. S., M. B. O. U. | Illustrated by Henrie Grönvold | London | R. H. Porter | 7 Princes Street, Cavendish Square, W.—Part I, February, 1907. Colored plate of eggs of British Warblers, 6 species, 34 figures; Sedge Warbler, pp. 1–14, 1 colored and 4 photogravure plates; Grasshopper Warbler, pp. 1–24, 2 colored and 6 photogravure plates. Two maps, geographical distribution of Grasshopper and Savi's Warblers. Part II, March, 1908. Chiff-chaff, pp. 1–31, 2 colored and 6 photogravure plates; Yellow-browed Warbler, pp. 1–3, 1 colored plate. Also colored plate each of Sedge Warblers (3 figures) and Grasshopper Warbler; 2 maps, geographical distribution of Sedge and Aquatic Warblers. Price, 21s net per part.

late been offered to the public as popular natural history. The colored plates and the photogravures are of a high grade of excellence, and the typography and general make-up of the work leave little ground for criticism.

The plan of treatment is as follows: (1) bibliographic references, restricted apparently to works which contain illustrations of the species under consideration; (2) vernacular names of the species, as known in the various countries comprised within its range; (3) description of the plumage, including its variations due to sex and age; (4) geographical distribution, with a map showing both summer and winter ranges; (4) life-history. The photogravure plates illustrate various attitudes of the bird assumed in courtship or in play, and also nestlings or young birds, and add greatly to the interest of the work. The account of the Grasshopper Warbler includes a long discussion of the theory of 'sexual selection,' for which his intimate studies of wild birds afford no support. He finds that the 'displays' of the male are by no means confined to the period of courtship. Under the Chiff-chaff the author discusses what he terms the "law of uniformity" in the behavior of birds, which "seems to extend to all the activities, whether referable to instinct or habit," but which does not prohibit variation in individual cases.—J. A. A.

NOTES AND NEWS.

LESLIE ALEXANDER LEE, an Associate of the American Ornithologists' Union, died at Portland, Maine, May 20, 1908, in the 56th year of his age. He was professor of biology and geology at Bowdoin College since 1881, and at the time of his death was president of the Maine Ornithological Society and of the Portland Society of Natural History. Professor Lee was born at Woodstock, Vermont, September 24, 1852. He was the son of John Stebbins Lee, the first president of St. Lawrence University, Canton, New York, from which the younger Lee was graduated in 1872. He took a post-graduate course at Harvard, and went to Bowdoin College as instructor in natural history in 1876. He was connected for a time with the United States Fish Commission, and was chief of the scientific staff of the 'Albatros' on a collecting voyage for the Smithsonian Institution through the Strait of Magellan and up the Pacific coast to San Francisco in 1887. In 1891 he organized and directed the Bowdoin College Expedition to Labrador. He was also, at the time of his death, State Geologist of Maine, and Chief of the Maine Topographical Survey Commission, which he organized. His numerous scientific papers relate mainly to marine biology. He was, however, deeply interested in ornithology, tak-

ing an active part in the work of the Maine Ornithological Society, which he served four years as president. His death is a great loss to the Society, and to the scientific interests of the State.

EDWARD AUGUSTUS SAMUELS, well-known as the author of an 'Ornithology and Oölogy of New England,' published originally in 1867, died at the home of his daughter, Mrs. John A. Barton, in Fitchburg, Massachusetts, May 27, 1908, at the age of nearly 72 years, he having been born in Boston, July 4, 1836, where the greater part of his life was spent. He was Assistant Secretary of the Massachusetts State Board of Agriculture and curator of the State collections of natural history from 1860 to 1880, and in 1885 was elected president of the Massachusetts Fish and Game Protective Association, which office he filled for seven years. His 'Ornithology and Oölogy of New England' passed through numerous editions, the title being changed in the fifth edition (1870) to 'The Birds of New England,' and though still printed from the original stereotype-plates, contained an Appendix of 70 pages of new matter. Although a compilation, the technical matter being taken from Baird's 'Birds of North America' (1858), and much other matter naturally from Wilson, Audubon, and Nuttall, it proved of great service as a popular work on the birds of the region treated, and for many years was the only one of its kind available. His 'Among the Birds,' a series of sketches for young folks, appeared in 1868, and was well adapted to interest young people in birds. He was also author of 'Mammalogy of New England,' 'With Fly-rod and Camera,' 'The Living World,' and other works of like character, and a frequent contributor to 'Forest and Stream,' and other journals devoted to natural history and field sports. An appreciative notice of Mr. Samuels, with a portrait, is given in 'Forest and Stream' for June 13, 1908.

IN APRIL last the A. O. U. Committee on Nomenclature and Classification of North American Birds held a four days' session in Washington, and took final action on practically all of the cases before it. Of the few still deferred, the greater part can doubtless be settled in time for inclusion in the new edition of the Check-List, which the Committee expects to have ready for the press in a few months. As the results of the Committee's work, not only during this session but for the past four years, are embodied in the Fourteenth Supplement to the Check-List, published in the present number of 'The Auk,' it is unnecessary to give further details here. . . .

THE A. O. U. Revised Code of Nomenclature is now in press and will be issued next month. Many of the Canons have been more or less changed, usually by amplification without materially changing their purport or purpose; a few have been radically modified, chiefly by the adoption of the new 'Article 30' of the International Code of Zoölogical Nomenclature, which relates to the method of determining the types of genera. Copies

of the 'New Code' may be obtained on application to the Treasurer, Dr. Jonathan Dwight, Jr., 134 West 71st Street, New York City. Price, 50 cents.

MR. ROBERT RIDGWAY, whose departure for Costa Rica was announced in the last number of 'The Auk' (p. 248), returned in safety to this country about the middle of May. Although his visit was not as prolonged as originally intended, Mr. Ridgway succeeded, with the coöperation of his friends, in collecting over 900 birds, besides other material. His collecting stations were chiefly Escasú, at the base of the Cerro de la Candelaria; Guayabo, at the eastern base of the Volcan Turrialba; also at an altitude of over 9,000 feet on the volcano itself; and at Bonilla, east of Guayabo. Owing to the extreme dryness of the plateau districts of the interior, and of the western part of the country, several projected trips, notably one to Mount Turubales, were abandoned, there having been no rain since September of last year.

Mr. Ridgway attributes much of the success of his visit to the untiring efforts of his friend Mr. Zeledon, who outfitted a party in charge of Don Paco Basulto for a difficult journey into the Santa Maria de Dota and Cerro de la Muerte districts. This party started early in May, and the results of its explorations are expected to prove of great interest. It was Mr. Ridgway's intention to personally visit the Cerro de la Muerte region, but owing to the difficulties of travel he was obliged to forego it. Mr. Zeledon thereupon took steps to have collections made there, and a party was at once placed in the field.

After unpacking his Costa Rican spoils, Mr. Ridgway will resume work on the fifth part of his 'Birds of North and Middle America.' — C. W. R.

MR. FRANK M. CHAPMAN's trip to southern Florida (see *antea*, p. 249) for material for additional bird groups for the American Museum of Natural History was eminently successful, material being obtained for the construction of large 'habitat groups' of several of the Egrets and Herons, the White Ibis, and the Roseate Spoonbill. On the way down he made a visit to the Indian River Pelican colony on Pelican Island and secured a large number of cinematograph, or 'moving,' pictures of the birds, and also many colored photographs of them and, later, of Herons and Spoonbills. A large series of further 'habitat groups' are now in process of construction at the Museum, some of which we hope to illustrate in a later number of this Journal.

FOURTEENTH SUPPLEMENT TO THE AMERICAN
ORNITHOLOGISTS' UNION CHECK-LIST OF
NORTH AMERICAN BIRDS.

THE Thirteenth Supplement to the Check-List was issued in July, 1904 (*Auk*, XXI, pp. 411-424).¹ Since this date the Committee has held six sessions, all except one in Washington, at the following dates: April 21-25, 1905; January 17-20, 1906; November 16-17, 1906; April 18-23, 1907; December 12, 1907 (at Philadelphia); April 15-20, 1908.

In view of the probable early appearance of a third edition of the Check-List, authorized by the Union at the Stated Meeting held in November, 1906, it seemed best to the Committee to withhold its reports from publication till the results of its work should appear in the new Check-List. Now that the manuscript for the new edition is practically completed, it seems desirable that the Committee should, in accordance with precedent, give reasons for the changes it has instituted during the last four years, since these cannot be readily indicated in the Check-List. Its decisions involve, as usual, additions to and eliminations from the Check-List, changes in nomenclature and in the status of groups, and the rejection of many proposed additions, and changes in nomenclature and status.

The Committee has aimed to secure as stable a foundation as possible for the new Check-List, anticipating a few changes in names that would soon surely arise, as well as those already proposed. Nearly all of the nomenclature changes here recorded are due to the strict enforcement of the law of priority, and result from the recent bibliographic work of a large number of investigators, abroad as well as in America. As a result of the special interest and activity in this field, many previously little known or wholly overlooked early works have been discovered, and others have been scanned with greater care.

In this connection the Committee desires to recognize the important assistance it has had from its Secretary, Dr. Charles W.

¹ For date and place of publication of previous Supplements, see *Auk*, 1904, p. 411.

Richmond, who has placed freely at its disposal the results of years of bibliographic work made in connection with the preparation of an Index Catalogue to the generic and specific names of the birds of the world; some of these results are here for the first time published and are indicated as "RICHMOND, MS." The Committee also wishes to acknowledge its indebtedness to him for compiling and arranging the present Supplement for publication.

Covering as it does a long and prolific period, the present Supplement is necessarily voluminous, and in the interest of clearness of presentation has been divided into five categories, as follows: I, Additions; II, Eliminations; III, Changes in Nomenclature, including Changes in Status; IV, Proposed Additions and Changes not Accepted; V, Deferred Cases.

Great effort has been made during the last two meetings of the Committee to cover all the cases known to require consideration; as a result the list of 'deferred cases' has been reduced to a small number, and probably the greater part of these will be settled in time to be included in the new edition of the Check-List.

The geographic ranges of the recently added species and subspecies have been omitted in the present Supplement, as a general revision of the ranges of all of the species and subspecies is now being made for the new edition of the Check-List.

	{ J. A. ALLEN, <i>Chairman</i> .
	{ CHARLES W. RICHMOND, <i>Secretary</i> .
	{ WILLIAM BREWSTER.
Committee.	{ JONATHAN DWIGHT, JR.
	{ C. HART MERRIAM.
	{ ROBERT RIDGWAY.
	{ WITMER STONE.

1. ADDITIONS TO THE CHECK-LIST.

SUBGENUS **BRACHYRAMPHUS**. To be inserted before Nos. 23 and 24.

SUBGENUS **ENDOMYCHURA** OBERHOLSER.

Endomychura OBERHOLSER, Proc. Acad. Nat. Sci. Phila., 1899, 201. Type, *Brachyramphus hypoleucus* XANTUS.

Admitted as a subgenus, to include Nos. 25 and 26.

75a. **Sterna fuscata crissalis** (LAWRENCE).

Crissal Sooty Tern.

Haliplana fuliginosa var. *crissalis* LAWRENCE, Proc. Bost. Soc. Nat. Hist., XIV, 1872, 285. (Cf. COUES, Key, ed. 5, II, 1903, 1016.)

Two subgenera are introduced under *Diomedea*, as follows:

SUBGENUS **PHŒBASTRIA** REICHENBACH.

Phæbастria REICHENBACH, Syst. Avium, 1852, v. Type, *Diomedea brachyura* TEMMINCK = *D. albatrus* PALLAS. (Cf. COUES, Osprey, III, 1899, 144.) This includes Nos. 81, 82, and 82.1.

SUBGENUS **DIOMEDEA**. Includes *D. exulans*, of the Hypothetical List.

SUBGENUS **OCEANODROMA**. This is introduced before No. 105, to include *O. furcata*, while the remaining species of the List are included in the

SUBGENUS **CYMOCHOREA** COUES.

Cymochorea COUES, Proc. Acad. Nat. Sci. Phila., 1864, 75. Type, *Procellaria leucorhoa* VIEILLOT. (Cf. COUES, Osprey, III, 1899, 144.)

SUBGENUS **ARISTONETTA** BAIRD.

Aristonetta BAIRD, Reports Expl. & Surv. R. R. Pac., IX,
1858, 793. Type, *Anas vallisneria* WILSON.

This is admitted to include No. 147.

171.2. **Anser brachyrhynchus** BAILLON.**Pink-footed Goose.**

Anser brachyrhynchus BAILLON, Mém. Soc. Imp. d'Émul.
d'Abbeville, 1833, 74.

Admitted on the basis of its occurrence in Greenland. (Cf.
SCHALOW, Vögel Arktis, 1904, 176.)

210.1. **Rallus levipes** BANGS.**Light-footed Rail.**

Rallus levipes BANGS, Proc. N. Engl. Zoöl. Club, I, 1899, 45.

GENUS **RHYACOPHILUS** KAUP.

Rhyacophilus KAUP, Skizz. Entw.-Gesch. Eur. Thierw., I,
1829, 140. Type, *Tringa glareola* LINNÆUS.

257.1. **Rhyacophilus glareola** (LINNÆUS).**Wood Sandpiper.**

Tringa glareola LINNÆUS, Syst. Nat. ed. 10, I, 1758, 149.

Admitted to the List on the strength of its occurrence in Alaska.
(Cf. LITTLEJOHN, Condor, VI, 1904, 138.)

304a. **Lagopus leucurus peninsularis** CHAPMAN.**Kenai White-tailed Ptarmigan.**

Lagopus leucurus peninsularis CHAPMAN, Bull. Am. Mus.
N. H., XVI, 1902, 236.

(No. 304a of the 10th Supplement is eliminated, as equivalent to
No. 304.)

SUBGENUS **BUTEO**. This should be introduced above No. 337.

356. **Falco peregrinus** TUNSTALL.

Peregrine Falcon.

Falco peregrinus TUNSTALL, Orn. Britannica, 1771, 1.

Admitted on the basis of its occurrence in Greenland. (*Cf.* SCHALOW, *Vögel Arktis*, 1904, 225.) The present Nos. 356 and 356*a* of the Check-List thus become 356*a* and 356*b*.

360c. **Falco sparverius paulus** (HOWE & KING).

Little Sparrow Hawk.

Cerchneis sparverius paulus HOWE & KING, *Contrib. N. A. Orn.*, I, 1902, 28.

The small resident form of Florida.

375f. **Bubo virginianus heterocnemis** (OBERHOLSER).

Labrador Horned Owl.

Asio magellanicus heterocnemis OBERHOLSER, *Proc. U. S. Nat. Mus.*, XXVII, 1904, 187.

375g. **Bubo virginianus algistus** (OBERHOLSER).

St. Michael Horned Owl.

Asio magellanicus algistus OBERHOLSER, *Proc. U. S. Nat. Mus.*, XXVII, 1904, 190.

420d. **Chordeiles virginianus hesperis** J. GRINNELL.

Pacific Nighthawk.

Chordeiles virginianus hesperis J. GRINNELL, *Condor*, VII, 1905, 170.

GENUS **ATTHIS** REICHENBACH.

Atthis REICHENBACH, *Journ. f. Orn.*, 1853, Extra-Heft, 1854 (Aufz. der Colib.), 12. Type, *Ornismya heloisa* LESSON & DELATTRE.

This reference was accidentally omitted from the Ninth Supplement.

GENUS **URANOMITRA** REICHENBACH.

Uranomitra REICHENBACH, Journ. f. Orn., 1853, Extra-Heft, 1854 (Aufz. der Colib.), 10. Type, *Trochilus franciæ* BOURCIER & MULSANT.

439.1. **Uranomitra salvini** (BREWSTER).

Salvin's Hummingbird.

Cyanomyia salvini BREWSTER, Auk, X, July, 1893, 214.

Admitted to the List by reason of its occurrence in Arizona. (Cf. BISHOP, Auk, XXIII, 1906, 337, 338.)

478e. **Cyanocitta stelleri carbonacea** J. GRINNELL.

Coast Jay.

Cyanocitta stelleri carbonacea J. GRINNELL, Condor, II, 1900, 127.

488b. **Corvus brachyrhynchos hesperis** (RIDGWAY).

Western Crow.

Corvus americanus hesperis RIDGWAY, Manual N. A. Birds, 1887, 362.

490.1. **Corvus frugilegus** LINNÆUS.

Rook.

Corvus frugilegus LINNÆUS, Syst. Nat., ed. 10, I, 1758, 105.

490.2. **Corvus cornix** LINNÆUS.

Hooded Crow.

Corvus cornix LINNÆUS, Syst. Nat., ed. 10, I, 1758, 105.

Nos. 490.1 and 490.2 are admitted by reason of their occurrence in Greenland. (Cf. SCHALOW, Vögel Arktis, 1904, 242, 243.)

- 574.1b. **Amphispiza nevadensis canescens** (J. GRINNELL).

California Sage Sparrow.

Amphispiza belli canescens J. GRINNELL, Condor, VII, 1905,
18.

- 581p. **Melospiza melodia cleonensis** MCGREGOR.

Mendocino Song Sparrow.

Melospiza melodia cleonensis MCGREGOR, Bull. Cooper Orn.
Club, I, 1899, 87.

- 585e. **Passerella iliaca fuliginosa** RIDGWAY.

Sooty Fox Sparrow.

Passerella iliaca fuliginosa RIDGWAY, Auk, XVI, 1899, 36.

- 585f. **Passerella iliaca insularis** RIDGWAY.

Kadiak Fox Sparrow.

Passerella iliaca insularis RIDGWAY, Auk, XVII, 1900, 30.

- 585g. **Passerella iliaca townsendi** (AUDUBON).

Townsend's Sparrow.

Plectrophanes townsendi AUDUBON, Birds Amer., IV, 1838,
pl. 424, fig. 7. (Folio edition.)

- 611.2. **Progne chalybea** (GMELIN).

Gray-breasted Martin.

Hirundo chalybea GMELIN, Syst. Nat., I, ii, 1788, 1026.

Admitted to the List on the strength of its occurrence in Texas.
(Cf. MILLER, Auk, XXIII, 1906, 226.)

- 613.1. **Hirundo rustica** LINNÆUS.

Swallow.

Hirundo rustica LINNÆUS, Syst. Nat., ed. 10, I, 1758, 191.

GENUS **CHELIDONARIA** REICHENOW.

Chelidonaria REICHENOW, Journ. f. Orn., 1889, 187. Type,
Hirundo urbica LINNÆUS.

615.2. **Chelidonaria urbica** (LINNÆUS).

Martin.

Hirundo urbica LINNÆUS, Syst. Nat., ed. 10, I, 1758, 192.

This and the preceding are introduced as visitants to Greenland.
(Cf. SCHALOW, Vögel Arktis, 1904, 258.)

632d. **Vireo huttoni cognatus** RIDGWAY.

Frazar's Vireo.

Vireo huttoni cognatus RIDGWAY, Proc. Biol. Soc. Wash.,
XVI, 1903, 107.

633b. **Vireo bellii medius** OBERHOLSER.

Texas Vireo.

Vireo bellii medius OBERHOLSER, Proc. Biol. Soc. Wash., XVI,
1903, 17.

652c. **Dendroica æstiva brewsteri** J. GRINNELL.

California Yellow Warbler.

Dendroica æstiva brewsteri J. GRINNELL, Condor, V, 1903, 72.

715a. **Salpinctes obsoletus pulverius** J. GRINNELL.

San Nicolas Rock Wren.

Salpinctes obsoletus pulverius J. GRINNELL, Auk, XV, 1898,
238. (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt.
III, 1904, 649.)

732a. **Bæolophus atricristatus sennetti** RIDGWAY.

Sennett's Titmouse.

Bæolophus atricristatus sennetti RIDGWAY, Bull. U. S. Nat.
Mus., No. 50, Pt. III, 1904, 386. (Cf. ALLEN, Bull. Am.
Mus. N. H., XXIII, 1907, 467-481.)

736b. **Penthestes carolinensis impiger** (BANGS).

Florida Chickadee.

Parus carolinensis impiger BANGS, Proc. N. Engl. Zoöl. Club, IV, 1903, 1. (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. III, 1904, 406.)

738a. **Penthestes gambeli baileyæ** (J. GRINNELL).

Bailey's Mountain Chickadee.

Parus gambeli baileyæ J. GRINNELL, Condor, X, 1908, 29.

740a. **Penthestes hudsonicus littoralis** (H. BRYANT).

Acadian Chickadee.

Parus hudsonicus, var. *littoralis* H. BRYANT, Proc. Bost. Soc. N. H., IX, 1865, 368. (Cf. CHAPMAN, Bull. Am. Mus. N. H., XVI, 1902, 245; RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. III, 1904, 415.)

742c. **Chamæa fasciata rufula** RIDGWAY.

Ruddy Wren-Tit.

Chamæa fasciata rufula RIDGWAY, Proc. Biol. Soc. Wash., XVI, 1903, 109.

759d. **Hylocichla guttata slevini** (J. GRINNELL).

Monterey Hermit Thrush.

Hylocichla aonalaschkæ slevini J. GRINNELL, Auk, XVIII, 1901, 258.

759e. **Hylocichla guttata sequoiensis** (BELDING).

Sierra Hermit Thrush.

Turdus sequoiensis BELDING, Proc. Calif. Acad. Sci., Ser. 2, II, 1889, 18. (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. IV, 1907, 44.)

II. ELIMINATIONS.

- 1 (Hypothetical List). *Æchmophorus clarkii* (LAWRENCE). A synonym of *Æ. occidentalis*.
- 3 (Hypothetical List). *Cepphus carbo* PALLAS. Not North American.
- 42.1. *Larus barrobianus* RIDGWAY. Equivalent to *L. glaucus* (= *L. hyperboreus*). (Cf. DWIGHT, Auk, XXIII, 1906, 29.)
94. *Puffinus fuliginosus* STRICKLAND. Equivalent to *P. griseus* (GMELIN). (Cf. SALVIN, Cat. Birds Brit. Mus., XXV, 1896, 386.)
- SUBGENUS **SULA** and SUBGENUS **DYSPORUS** are to be removed.
- 7 (Hypothetical List). *Phalacrocorax perspicillatus* PALLAS. No evidence of its occurrence in North America.
- 133a. *Anas obscura rubripes* BREWSTER. Equivalent to No. 133. (See No. 133, under 'Changes of Nomenclature.')
173. *Branta bernicla* (LINNÆUS). Not North American, its place in the List being filled by No. 173a.
- 9 (Hypothetical List). *Ardea wuerdemanni* BAIRD. Removed from the List as being in all probability a hybrid between *A. occidentalis* and *A. wardi*.
- 10 (Hypothetical List). *Ardea* (*Dichromanassa*) *pealei* BONAPARTE. This is eliminated as a color phase of *Dichromanassa rufescens*.
- 277a. *Ægialitis meloda circumcincta* RIDGWAY. Equivalent to No. 277. (Cf. SHARPE, Cat. Birds Brit. Mus., XXIV, 1896, 294.)
- 304a. *Lagopus leucurus altipetens* OSGOOD. Not separable from No. 304.

13 (Hypothetical List). **Cathartes burrovianus** CASSIN. The claims of this alleged species as an inhabitant of Texas are considered too unsatisfactory for its continuance in the List; moreover, according to Nelson, *C. burrovianus* is equivalent to *C. aura* (*cf.* Proc. Biol. Soc. Wash., XVIII, 1905, 122-125).

[336.] **Buteo buteo** (LINNÆUS).

[347.] **Archibuteo lagopus** (BRÜNNICH). It is now believed the introduction of these species into the List was unwarranted, and based on faulty records.

16.2 (Hypothetical List). **Trochilus violajugulum** JEFFRIES. Removed as being a hybrid. (*Cf.* THAYER & BANGS, Auk, XXIV, 1907, 313.)

431.1 **Selasphorus floresii** GOULD. Eliminated, as the Check-List record was based on a hybrid. (*Cf.* THAYER & BANGS, Auk, XXIV, 1907, 313.)

[450.] **Myiozetetes similis superciliosus** (BONAPARTE).

[455.] **Myiarchus lawrencei** (GIRAUD). These two species are removed, as based exclusively upon Giraud's unconfirmed "Texas" records.

464.2. **Empidonax insulicola** OBERHOLSER. Not satisfactorily differentiated from *E. difficilis*. (*Cf.* RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. IV, 1907, 579.)

[470.] **Empidonax fulvifrons** (GIRAUD). Eliminated, as based exclusively upon Giraud's unconfirmed "Texas" record.

472a. **Ornithion imberbe ridgwayi** BREWSTER. Proves to be inseparable from No. 472. (*Cf.* RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. IV, 1907, 416.)

GENUS **EUPHONIA** DESMAREST.

[606.] **Euphonia elegantissima** (BONAPARTE). Removed, as based wholly upon Giraud's unconfirmed "Texas" record.

SUBFAMILY **AMPELINÆ**. To be removed, as serving no purpose since the elevation of the "SUBFAMILY **Ptilogonatinæ**" to family rank.

GENUS **HYLOPHILUS** TEMMINCK.

- 19 (Hypothetical List). **Hylophilus decurtatus** (BONAPARTE). Eliminated, as based exclusively upon Giraud's "Texas" record.
- 20 (Hypothetical List). **Helminthophila lawrencii** (HERRICK).
- 21 (Hypothetical List). **Helminthophila leucobronchialis** (BREWSTER).
- 22 (Hypothetical List). **Helminthophila cincinnatiensis** (LANGDON). These are eliminated as probable hybrids. (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. II, 1902, 446, 452-455.)
- 681*d*. **Geothlypis trichas brachidactyla** (SWAINSON). Believed to be too near *G. trichas* for recognition by name.
- [689.] **Setophaga miniata** SWAINSON.

GENUS **ERGATICUS** BAIRD.

- [691.] **Ergaticus ruber** (SWAINSON).

GENUS **BASILEUTERUS** CABANIS.

- [692.] **Basileuterus culicivorus brasherii** (GIRAUD).
- [693.] **Basileuterus belli** (GIRAUD).

Nos. [689] and [691] to [693], including the genera *Ergaticus* and *Basileuterus*, are to be expunged from the List, as based exclusively upon Giraud's unconfirmed "Texas" records.

- 710*a*. **Toxostoma redivivum pasadenense** (GRINNELL). This proves to be indistinguishable from No. 710. (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. IV, 1907, 205.)

- 721*b*. **Troglodytes ædon aztecus** BAIRD. Eliminated, as being inseparable from *T. a. parkmani*. (*Cf.* RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. III, 1904, 582.)
- 731*a*. **Bæolophus bicolor texensis** (SENNETT). Cancelled, as being a hybrid. (*Cf.* RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. III, 1904, 386; ALLEN, Bull. Am. Mus. N. H., XXIII, 1907, 467-481.)
- 733*c*. **Bæolophus inornatus restrictus** RIDGWAY. Eliminated, as having been based upon soot-stained examples of *B. inornatus* from the vicinity of San Francisco. (*Cf.* GRINNELL, Auk, XXIII, 1906, 186.)
- 740*a*. **Parus hudsonicus stoneyi** (RIDGWAY).
- 740*b*. **Parus hudsonicus columbianus** RHOADS. These are to be expunged from the List, as indistinguishable from No. 740.
- 758*b*. **Hylocichla ustulata ædica** OBERHOLSER.
- 758*c*. **Hylocichla ustulata almæ** OBERHOLSER. Both to be eliminated, *ædica* being inseparable from *ustulata*, while *almæ* becomes a synonym of *swainsoni*. (*Cf.* RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. IV, 1907, 52, 55.)

III. CHANGES IN NOMENCLATURE, INCLUDING CHANGES IN STATUS.

SUBORDER **PODICIPEDES**. This becomes

SUBORDER **COLYMBI**.

FAMILY **PODICIPIDÆ**. This is changed to

FAMILY **COLYMBIDÆ**.

SUBGENUS **PODICEPS** LATHAM. Replaced by

SUBGENUS **TACHYBAPTUS** REICHENBACH.

Tachybaptus REICHENBACH, Avium Syst. Nat., 1849, pl. ii.
Type, *Colymbus minor* GMELIN = *C. ruficollis* PALLAS. (Cf.
STONE, Auk, 1907, 190; ALLEN, Bull. Am. Mus. N. H.,
XXIV, 1908, 24.)

7. **Gavia imber** (GUNNERUS). Gunnerus is found to be not strictly binomial at 1761, and the authority for this name (with slight alteration in the spelling) is changed to

7. **Gavia immer** (BRÜNNICH).

Colymbus immer BRÜNNICH, Orn. Borealis, 1764, 38.

11. **Gavia lumme** (GUNNERUS). As this author is not acceptable at 1761, this species becomes

11. **Gavia stellata** (PONTOPPIDAN).

Colymbus stellatus PONTOPPIDAN, Danske Atlas, I, 1763, 621.
(Based on *Colymbus maximus stellatus* of Willughby, which Lönnerberg identifies as *Colymbus lumme* BRÜNNICH = *Colymbus stellatus* of the same author; cf. LÖNNBERG, Orn. Monatsb., 1907, 76.) (RICHMOND, MS.)

SUBFAMILY **PHALERINÆ** of the Check-List, becomes

SUBFAMILY **ÆTHIINÆ**.

GENUS **CYCLORRHYNCHUS** KAUP. This becomes

GENUS **PHALERIS** TEMMINCK.

Phaleris TEMMINCK, Man. d'Orn., ed. 2, I, 1820, cxii. Type,
Alca psittacula PALLAS. (Cf. ALLEN, Bull. Am. Mus. N. H.,
XXIV, 1908, 37.)

17. **Cyclorhynchus psittaculus** (PALLAS). This becomes
17. **Phaleris psittacula** (PALLAS).

GENUS **SIMORHYNCHUS** MERREM. An earlier name is found in

GENUS **ÆTHIA** DUMONT.

Æthia DUMONT, Dict. Sci. Nat. (revised ed.), I, 1816, Suppl.,

71. Type, *Alca cristatella* PALLAS. (Cf. STONE, Auk, 1907, 190.)

Nos. 18, 19, and 20 thus become

18. **Æthia cristatella** (PALLAS).

19. **Æthia pygmæa** (GMELIN).

20. **Æthia pusilla** (PALLAS).

By reason of the adoption of *Phaleris* in place of *Cyclorrhynchus*, the subgenus **Phaleris** of the Check-List becomes

SUBGENUS **ALCELLA** STONE.

Alcella STONE, Auk, XXIV, 1907, 197. Type, *Alca pygmæa*

GMELIN. (Cf. STONE, Auk, 1907, 197; ALLEN, Bull. Am. Mus. N. H., XXIII, 1907, 292; XXIV, 1908, 15.)

24. **Brachyramphus kittlitzii** BRANDT. This becomes

24. **Brachyramphus brevirostris** (VIGORS).

Uria brevirostris VIGORS, Zool. Journal, IV, 1829, 357. (Cf. GRANT, Cat. Birds Brit. Mus., XXVI, 1898, 593.)

42. **Larus glaucus** BRÜNNICH. This is antedated by *Larus glaucus* PONTOPPIDAN, 1763, based on Brisson, Orn., VI, 1760, 182, pl. 16, fig. 2, which = *Larus canus* LINNÆUS, 1758. The next name for the Glaucous Gull appears to be

42. **Larus hyperboreus** GUNNERUS.

Larus hyperboreus GUNNERUS, in LEEM, Beskr. Finm. Lapper, 1767, 226 (note). (RICHMOND, MS.)

51. **Larus argentatus** BRÜNNICH. The authority is changed to

51. **Larus argentatus** PONTOPPIDAN.

Larus argentatus PONTOPPIDAN, Danske Atlas, I, 1763, 622. (RICHMOND, MS.)

[56.] **Larus canus** LINNÆUS. This becomes No. 3.1 of the Hypothetical List.

75. **Sterna fuliginosa** GMELIN. This becomes

75. **Sterna fuscata** LINNÆUS.

Sterna fuscata LINNÆUS, Syst. Nat., ed. 12, I, 1766, 228. (Cf. BUREAU, Bull. Soc. Sci. Nat. Ouest France, XIV, 1904, 229-233.)

84. **Phœbetria fuliginosa** (GMELIN). An earlier name is

84. **Phœbetria palpebrata** (J. R. FORSTER).

Diomedea palpebrata FORSTER, Mém. pres. Acad. Roy. Sci., X, 1785, 571, pl. xv. (RICHMOND, MS.)

GENUS **OSSIFRAGA** HOMBRON & JACQUINOT. This is changed to

GENUS **MACRONECTES** RICHMOND.

Macronectes RICHMOND, Proc. Biol. Soc. Wash., XVIII, 1905, 76. Type, *Procellaria gigantea* GMELIN. *Ossifraga* HOMBRON & JACQUINOT, 1844, proves to be preoccupied by *Ossifraga* WOOD, 1835.

No. [85] of the Check-List thus becomes

[85.] **Macronectes giganteus** (GMELIN).

GENUS **PROCELLARIA** LINNÆUS. This becomes

GENUS **THALASSIDROMA** VIGORS.

Thalassidroma VIGORS, Zool. Journal, II, 1825, 405 (note). Type, *Procellaria pelagica* LINNÆUS. (Cf. ALLEN, Bull. Am. Mus. N. H., XXIV, 1908, 11, 25.)

No. 104 of the Check-List thus becomes

104. **Thalassidroma pelagica** (LINNÆUS).

[106.2.] **Oceanodroma cryptoleucura** (RIDGWAY). This is changed to

[106.2.] **Oceanodroma castro** (HARCOURT).

Thalassidroma castro HARCOURT, Sketch of Madeira, 1851, 123.
(Cf. DUBOIS, Syn. Avium, II, 1903, 1029; GRANT, Ibis, 1898, 314.)

GENUS **SULA** BRISSON. The type should be changed to *Pelecanus piscator* LINNÆUS. (Cf. ALLEN, Bull. Am. Mus. N. H., XXIV, 1908, 28.)

115. **Sula sula** (LINNÆUS). This is changed to

115. **Sula leucogastra** (BODDAERT).

Pelecanus leucogaster BODDAERT, Table Pl. Enl., 1783, 57.
Pelecanus sula LINNÆUS, 1766, proves not to be the species usually recognized under this name, but a synonym of *P. piscator*. (Cf. NELSON, Proc. Biol. Soc. Wash., XVIII, 1905, 121.)

120. **Phalacrocorax dilophus** (SWAINSON). This becomes

120. **Phalacrocorax auritus** (LESSON).

Carbo auritus LESSON, Traité d'Orn., 1831, 605.

The name *dilophus*, having been applied by Vieillot in 1817, to a New Zealand species, is not available for the Double-crested Cormorant. (Cf. GRANT, Cat. Birds Brit. Mus., XXVI, 1898, 355, 370.)

Nos. 120a, 120b, and 120c require correction as follows:

120a. **Phalacrocorax auritus floridanus** (AUDUBON).

120b. **Phalacrocorax auritus cinctatus** (BRANDT).

120c. **Phalacrocorax auritus albociliatus** (RIDGWAY).

121. **Phalacrocorax mexicanus** (BRANDT). This becomes a subspecies of *P. vigua* (VIEILLOT). (Cf. GRANT, Cat. Birds Brit. Mus., XXVI, 1898, 381.)

121. **Phalacrocorax vigua mexicanus** (BRANDT).

GENUS **FREGATA** BRISSON. Authority changed to

GENUS **FREGATA** LACÉPÈDE.

Fregata LACÉPÈDE, Tabl. Ois., 1799, 15. Type, *Pelecanus aquilus* LINNÆUS.

Fregata proves not to have been used in a generic sense by Brisson. (Cf. STONE, Auk, XXIV, 1907, 195; ALLEN, Bull. Am. Mus. N. H., XXIII, 1907, 301; XXIV, 1908, 18.)

GENUS **MERGANSER** BRISSON. This becomes

GENUS **MERGUS** LINNÆUS.

Mergus LINNÆUS, Syst. Nat., ed. 10, I, 1758, 129. Type, *Mergus merganser* LINNÆUS. (Cf. ALLEN, Bull. Am. Mus. N. H., XXIV, 1908, 36.)

Nos. 129 and 130 will therefore stand as

129. **Mergus americanus** CASSIN.

130. **Mergus serrator** LINNÆUS.

GENUS **MERGUS** LINNÆUS, for No. [131.1], becomes

GENUS **MERGELLUS** SELBY.

Mergellus SELBY, Cat. Gen. and Subgen. Types of Birds, 1840, 47. Type, *Mergus albellus* LINNÆUS. (Cf. ALLEN, Bull. Am. Mus. N. H., XXIV, 1908, 20.)

This necessitates a change of name in No. [131.1] to

[131.1] **Mergellus albellus** (LINNÆUS).

132. **Anas boschas** LINNÆUS. This becomes, by reason of anteriority,

132. **Anas platyrhynchos** LINNÆUS.

Anas platyrhynchos LINNÆUS, Syst. Nat., ed. 10, I, 1758, 125. (Cf. LÖNNBERG, Journ. f. Orn., 1906, 528.)

133. *Anas obscura* GMELIN. This is changed to

133. *Anas rubripes* (BREWSTER).

Anas obscura rubripes BREWSTER, Auk, XIX, 1902, 184.

The name *Anas obscura* GMELIN, 1788, proves to be preoccupied by *Anas obscura* PONTOPPIDAN, 1763, for an Old World species, and no other name being available, *rubripes* of Brewster is adopted as a substitute. (RICHMOND, MS.) There is some question as to the validity of the form recognized as No. 133a, which, by the above action, is now cancelled. (See Eliminations.)

GENUS **QUERQUEDULA** STEPHENS. Authority is changed to

GENUS **QUERQUEDULA** OKEN.

Querquedula OKEN, Isis, I, 1817, 1183, Type, *Anas circia* LINNÆUS = *A. querquedula* LINNÆUS.

[141.1.] *Casarca casarca* (LINNÆUS). This becomes

[141.1.] *Casarca ferruginea* (PALLAS).

Anas ferruginea PALLAS, in VROEG'S Cat., 1764, Adumbr., 5.
(Cf. RICHMOND, Smiths. Misc. Coll., Quarterly Issue, XLVII, 1905, 346.)

GENUS **AYTHYA** BOIE. This becomes

GENUS **MARILA** OKEN.

Marila OKEN, Isis, I, 1817, 1183. Type, *Anas marila* LINNÆUS. (Cf. STONE, Auk, XXIV, 1907, 191; also ALLEN, Bull. Am. Mus. N. H., XXIV, 1908, 26.)

Aythya BOIE, 1822, is preoccupied by *Aethia* (or *Aethya*) DUMONT, 1816; moreover, its priority over *Nyroca* FLEMING, 1822, has never been satisfactorily demonstrated.

SUBGENUS **FULIGULA** STEPHENS, becomes

SUBGENUS **MARILA** OKEN.

Nos. 146 to 150 require change as follows:

- 146. **Marila americana** (EYTON).
- 147. **Marila vallisneria** (WILSON).
- 148. **Marila marila** (LINNÆUS).
- 149. **Marila affinis** (EYTON).
- 150. **Marila collaris** (DONOVAN).

GENUS **CLANGULA** LEACH, 1819. Authority becomes, by reason of priority,

GENUS **CLANGULA** OKEN.

Clangula OKEN, Isis, I, 1817, 1183. Type, *Anas clangula* LINNÆUS. (Cf. STONE, Auk, XXIV, 1907, 191.)

GENUS **CAMPTOLAIMUS** GRAY. This becomes

GENUS **CAMPTORHYNCHUS** BONAPARTE.

Camptorhynchus BONAPARTE, Geog. & Comp. List, April, 1838, 58. Type, *Anas labradoria* GMELIN. (Cf. STONE, Auk, XXIV, 1907, 191; ALLEN, Bull. Am. Mus. N. H., XXIV, 1908, 20.)

The name *Camptorhynchus* was first published by Bonaparte, whose work has priority over Eyton's 'Monograph of the Anatidæ' (where the name appears as *Kamptorhynchus*).

No. 156 thus becomes

- 156. **Camptorhynchus labradorius** (GMELIN).
- 178. **Dendrocygna fulva** (GMELIN). This becomes
- 178. **Dendrocygna bicolor** (VIEILLOT).

Anas bicolor VIEILLOT, Nouv. Diet. Hist. Nat., V, 1816, 136.

Anas fulva GMELIN, 1788, proves to be preoccupied by *Anas fulva* MEUSCHEN, 1787. (RICHMOND, MS.)

The following changes are made in the Family Ciconiidae:

SUBFAMILY **TANTALINÆ**, becomes

SUBFAMILY **MYCTERIINÆ**. Wood Ibises.

GENUS **TANTALUS** LINNÆUS, becomes

GENUS **MYCTERIA** LINNÆUS.

Mycteria LINNÆUS, Syst. Nat., ed. 10, I, 1758, 140. Type,
Mycteria americana LINNÆUS.

188. **Tantalus loculator** LINNÆUS, becomes

188. **Mycteria americana** LINNÆUS.

Wood Ibis.

Mycteria americana LINNÆUS, Syst. Nat., ed. 10, I, 1758, 140.

GENUS **MYCTERIA**, of the Check-List, becomes

GENUS **JABIRU** HELLMAYR.

Jabiru HELLMAYR, Abh. K. Bayer. Akad. Wiss., II Kl., XXII,
1906, 711. Type, *Ciconia mycteria* LICHTENSTEIN.

[189.] **Mycteria americana** LINNÆUS, becomes

[189.] **Jabiru mycteria** (LICHTENSTEIN).

Jabiru.

Ciconia mycteria LICHTENSTEIN, Abh. K. Akad. Wiss. Berlin
(Phys. Kl.), for 1816-17, 1819, 163.

The reasons for the above changes are fully explained by ALLEN,
Auk, XXV, 1908, 37, 38.

GENUS **BOTAURUS** HERMANN. Authority is changed to

GENUS **BOTAURUS** STEPHENS.

Botaurus STEPHENS, in SHAW, Gen. Zool., XI, ii, 1819, 592.
Type, *Ardea stellaris* LINNÆUS.

Hermann is considered not to have used the term in a generic sense. (Cf. STONE, Auk, XXIV, 1907, 195; ALLEN, Bull. Am. Mus. N. H., XXIII, 1907, 311.

GENUS **ARDETTA** GRAY. This becomes

GENUS **IXOBRYCHUS** BILLBERG.

Ixobrychus BILLBERG, Syn. Faunæ Scand., I, ii, 1828, 166.
Type, *Ardea minuta* LINNÆUS. (Cf. STONE, Auk, XXIV, 1907, 192; ALLEN, Bull. Am. Mus. N. H., XXIV, 1908, 36.)

Nos. 191 and 191.1 of the Check-List thus become

191. **Ixobrychus exilis** (GMELIN).

191.1 **Ixobrychus neoxenus** (CORY).

GENUS **NYCTICORAX** STEPHENS. Authority is changed to

GENUS **NYCTICORAX** T. FORSTER.

Nycticorax FORSTER, Synop. Cat. Brit. Birds, 1817, 59.
Type, *Nycticorax infaustus* FORSTER = *Ardea nycticorax* LINNÆUS. (Cf. STONE, Auk, XXIV, 1907, 195.)

207. **Aramus giganteus** (BONAPARTE). An earlier name is found in

207. **Aramus vociferus** (LATHAM).

Numenius vociferus LATHAM, Suppl. Ind. Orn., 1801, lxx.
(RICHMOND, MS.)

SUBGENUS **COTURNICOPS** BONAPARTE. Becomes

GENUS **COTURNICOPS** BONAPARTE.

Coturnicops BONAPARTE, Compt. Rend., XLIII, 1856, 599.
Type, *Fulica noveboracensis* GMELIN.

No. 215 thus becomes

215. **Coturnicops noveboracensis** (GMELIN).

SUBGENUS **CRECISCUS** CABANIS. This becomes

GENUS **CRECISCUS** CABANIS.

Creciscus CABANIS, Journ. f. Orn., 1856, 428. Type, *Rallus jamaicensis* GMELIN.

216. **Porzana jamaicensis** (GMELIN). This becomes

216. **Creciscus jamaicensis** (GMELIN).

No. 216.1 is now recognized as the western representative of the above, under the name

216.1. **Creciscus coturniculus** (RIDGWAY). (Cf. BREWSTER, Auk, XXIV, 1907, 205-210.)

GENUS **CRYMOPHILUS** VIEILLOT. This becomes

GENUS **PHALAROPUS** BRISSON.

Phalaropus BRISSON, Orn., VI, 1760, 12. Type, *Tringa fulicaria* LINNÆUS.

222. **Crymophilus fulicarius** (LINNÆUS). This is changed to

222. **Phalaropus fulicarius** (LINNÆUS).

GENUS **PHALAROPUS** BRISSON, of the Check-List, becomes

GENUS **LOBIPES** CUVIER.

Lobipes CUVIER, Règne Animal, I, 1817, 495. Type, *Tringa lobata* LINNÆUS.

No. 223 thus becomes

223. **Lobipes lobatus** (LINNÆUS).

The above changes in the family **Phalaropodidæ** are explained by STONE (Auk, XXIV, 1907, 196), and ALLEN (Bull. Am. Mus. N. H., XXIII, 1907, 315).

GENUS **GALLINAGO** LEACH. An earlier reference is found in

GENUS **GALLINAGO** KOCH.

Gallinago KOCH, Syst. Baier. Zool., 1816, 312. Type, *Scolopax gallinago* LINNÆUS. (Cf. STONE, Auk, XXIV, 1907, 191.)

230.1. **Gallinago major** (GMELIN). This becomes

230.1. **Gallinago media** (LATHAM).

Scolopax media LATHAM, Suppl. Gen. Syn., I, 1787, 292. (Cf. OBERHOLSER, Auk, XVI, 1899, 179.) Latham appears to have been the first author to use *media* in a binomial sense.

GENUS **MACRORHAMPHUS** LEACH. Authority changed to

GENUS **MACRORHAMPHUS** T. FORSTER.

Macrorhamphus FORSTER, Synop. Cat. Brit. Birds, 1817, 22. Type, *Scolopax grisea* GMELIN.

Macrorhamphus is a *nomen nudum* with Leach. (Cf. STONE, Auk, 1907, 195.)

In the genus **Arquatella**, Nos. 236 and 237 become subspecies of No. 235 (Cf. BISHOP, Waterfowl Family, 1903, 365), as follows:

235a. **Arquatella maritima couesi** (RIDGWAY).

235b. **Arquatella maritima ptilocnemis** (COUES).

GENUS **ACTODROMAS** KAUP. By the action of the law of priority, this becomes

GENUS **PISOBIA** BILLBERG.

Pisobia BILLBERG, Syn. Faunæ Scand., I, ii, 1828, 136. Type, *Tringa minuta* LEISLER. (Cf. LÖNNBERG, Journ. f. Orn., 1906, 532.)

238. **Actodromas acuminata** (HORSFIELD). This is changed to

238. **Pisobia aurita** (LATHAM).

Tringa aurita LATHAM, Suppl. Ind. Orn., 1801, lxvi. (Cf. SHARPE, Hist. Coll. Brit. Mus. Birds, 1906, 147.)

Nos. 239 to [242.1] are changed as below:

239. *Pisobia maculata* (VIEILLOT).

240. *Pisobia fuscicollis* (VIEILLOT).

241. *Pisobia bairdii* (COUES).

242. *Pisobia minutilla* (VIEILLOT).

[242.1.] *Pisobia damacensis* (HORSFIELD).

247. *Ereunetes occidentalis* LAWRENCE. This is antedated by

247. *Ereunetes mauri* CABANIS.

Ereunetes mauri CABANIS, Journ. f. Orn., 1856, 419. (Cf. ALLEN, Auk, XXIII, 1906, 97, 98.)

GENUS **CALIDRIS** CUVIER. Authority is changed to

GENUS **CALIDRIS** ILLIGER.

Calidris ILLIGER, Prodrumus, 1811, 249. Type, *Charadrius calidris* LINNÆUS = *Tringa leucophæa* PALLAS.

Calidris of Cuvier, 1800, is a *nomen nudum*. (Cf. STONE, Auk, XXIV, 1907, 195; ALLEN, Bull. Am. Mus. N. H., XXIII, 1907, 318; XXIV, 1908, 16.)

248. *Calidris arenaria* (LINNÆUS). This is changed to

248. *Calidris leucophæa* (PALLAS).

Tringa leucophæa PALLAS, in VROEG'S Cat., 1764, 32.

The name *Tringa leucophæa* has priority over *T. arenaria* LINNÆUS, 1766, as well as anteriority over *Trynga alba* in the Appendix to Vroeg's Catalogue. (RICHMOND, MS.)

GENUS **SYMPHEMIA** RAFINESQUE. This becomes

GENUS **CATOPTROPHORUS** BONAPARTE.

Catoptrophorus BONAPARTE, Ann. Lyc. N. H. N. Y., II, 1827, 323. Type, *Scolopax semipalmata* GMELIN. (Cf. RICHMOND, Proc. Biol. Soc. Wash., XVIII, 1905, 75.)

Symphemia proves to have been based on *Tringa semipalmata*, not *Scolopax semipalmata*, and is a synonym of *Ereunetes*.

Nos. 258 and 258a thus become

258. **Catoptrophorus semipalmatus** (GMELIN).

258a. **Catoptrophorus semipalmatus inornatus** (BREWSTER).

264. **Numenius longirostris** WILSON. An earlier name occurs in

264. **Numenius americanus** BECHSTEIN.

Numenius americanus BECHSTEIN, in LATHAM, Allg. Ueb. Vögel, IV, ii, 1812, 432. (RICHMOND, MS.)

283.1. **Arenaria morinella** (LINNÆUS). This becomes a subspecies of No. 283, and will stand as

283a. **Arenaria interpres morinella** (LINNÆUS).

The Ruddy Turnstone is found to intergrade with *A. interpres*, and the above change becomes necessary. (Cf. BISHOP, Auk, XXIII, 1906, 335.)

316. **Zenaidura macroura** (LINNÆUS). This becomes

316. **Zenaidura macroura carolinensis** (LINNÆUS).

Columba carolinensis LINNÆUS, Syst. Nat., ed. 12, I, 1766, 286.

Linnæus appears to have based the name *Columba macroura* on Edwards's plate 15, and not on Catesby. On this assumption *Zenaidura macroura* becomes the name of the West Indian bird, while that for the continental form is as given above. (Cf. also, BANGS, Proc. Biol. Soc. Wash., XIX, 1906, 44.)

319. **Melopelia leucoptera** (LINNÆUS). This is changed to

319. **Melopelia asiatica** (LINNÆUS).

Columba asiatica LINNÆUS, Syst. Nat., ed. 10, I, 1758, 163.

The name *asiatica* has anteriority over *leucoptera*, and should be substituted for it, both names having exactly the same foundation. (RICHMOND, MS).

GENUS **GYPAGUS** VIEILLOT. This becomes

GENUS **SARCORAMPHUS** DUMÉRIL.

Sarcoramphus DUMÉRIL, Zool. Analytique, 1806, 32. Type,
Vultur papa LINNÆUS. (*Cf.* ALLEN, Bull. Am. Mus. N. H.,
XXIV, 1908, 35, 38.)

No. 12 of the Hypothetical List therefore becomes

12. **Sarcoramphus papa** (LINNÆUS).

325. **Cathartes aura** (LINNÆUS). This is changed to

325. **Cathartes aura septentrionalis** (WIED).

Cathartes septentrionalis WIED, Reise Nord-America, I, 1839,
162.

The name *aura* is considered to have been based on the smaller
form, from Mexico, Central America and the West Indies. (*Cf.*
NELSON, Proc. Biol. Soc. Wash., XVIII, 1905, 122-125.)

SUBGENUS **ASTUR** LACÉPÈDE. This becomes

GENUS **ASTUR** LACÉPÈDE.

Astur LACÉPÈDE, Tabl. Ois., 1799, 4. Type, *Falco pal-*
umbarius LINNÆUS. (*Cf.* COUES, Osprey, III, 1899, 144.)

Nos. 334 and 334a are thus changed to

334. **Astur atricapillus** (WILSON).

334a. **Astur atricapillus striatulus** RIDGWAY.

GENUS **URUBITINGA** LESSON. Authority becomes

GENUS **URUBITINGA** LAFRESNAYE.

Urubitinga LAFRESNAYE, Dict. Univ. Hist. Nat., II, 1843, 786.
Type, *Falco urubitinga* GMELIN. (*Cf.* STONE, Auk, XXIV,
1907, 195.)

358. *Falco richardsonii* RIDGWAY, becomes a subspecies of No. 357, and will stand as

357b. *Falco columbarius richardsonii* (RIDGWAY).

[358.1.] *Falco regulus* PALLAS. An earlier name occurs in

[358.1.] *Falco æsalon* TUNSTALL.

Falco æsalon TUNSTALL, Orn. Britannica, 1771, 1. (RICHMOND, MS.)

FAMILY **STRIGIDÆ**. Barn Owls. This becomes

FAMILY **ALUCONIDÆ**. Barn Owls.

GENUS **STRIX** LINNÆUS. Becomes

GENUS **ALUCO** FLEMING.

Aluco FLEMING, Philos. Zool., II, 1822, 236. Type, *Strix flammea* LINNÆUS, 1766 (*nec* PONTOPPIDAN, 1763) = *Strix alba* SCOPOLI, 1769.

It is found that *Strix* cannot be used for the Barn Owls, since the Barn Owl did not occur in the 10th edition of the *Systema Naturæ* (*Strix aluco* of 1758 proves to be the Wood Owl, or *S. stridula* of the same date, and not, as generally supposed, the Barn Owl), and Brisson, in 1760, fixed the type of *Strix* as *S. aluco*. (Cf. ALLEN, Auk, XXV, July, 1908, 288-291.) The generic name *Strix* is therefore transferred to the group hitherto known as *Syrnium*, while the family name **Bubonidæ** will give way to **Strigidæ**. (Cf. also: COUES, Key, ed. 5, II, 1903, 621.)

No. 365 thus becomes

365. *Aluco pratincola* (BONAPARTE).

FAMILY **BUBONIDÆ**. This becomes

FAMILY **STRIGIDÆ**.

367. *Asio accipitrinus* (PALLAS). An earlier name is found in

367. *Asio flammeus* (PONTOPPIDAN).

Strix flammea PONTOPPIDAN, Danske Atlas, I, 1763, 617, pl. XXV.

Pontoppidan's *Strix flammea* is based on Linnæus, Fauna Suecica, 1761, no. 73, which, in turn, is founded on Rudbeck's drawing. This is generally admitted to represent the Short-eared Owl. (Cf. also: NILSSON, Orn. Suecica, 1817, 62, and BILLBERG, Syn. Faunæ Scand., I, ii, 1828, 116.) (RICHMOND, MS.)

GENUS **SYRNIUM** SAVIGNY. This becomes

GENUS **STRIX** LINNÆUS.

Strix LINNÆUS, Syst. Nat., ed. 10, I, 1758, 92. Type, *Strix aluco* LINNÆUS, no. 6 = no. 9, or *Strix stridula*, of the same author. (Cf. ALLEN, Auk, XXV, July 1908, 290.)

The following changes are required in the nomenclature of Nos. 368 to 369a:

368. **Strix varia** BARTON.

368a. **Strix varia alleni** (RIDGWAY).

368b. **Strix varia albogilva** BANGS. Replaces *Syrnium nebulosum helveolum* BANGS, preoccupied by *Strix helvola* LICHTENSTEIN, 1842. (Cf. BANGS, Auk, XXV, 1908, 316.)

369. **Strix occidentalis** (XANTUS).

369a. **Strix occidentalis caurina** (MERRIAM).

GENUS **CRYPTOGLAUX** RICHMOND. This becomes

GENUS **GLAUX** MORRIS.

Glaux MORRIS, Naturalist (Wood's), II, 1837, 123. Type, *Strix tengmalmi* GMELIN = *Strix funerea* LINNÆUS. (RICHMOND, MS.)

371. **Cryptoglaux tengmalmi richardsoni** (BONAPARTE). This becomes

371. **Glaux funerea richardsoni** (BONAPARTE).

Strix funerea LINNÆUS proves to be equivalent to *S. tengmalmi* GMELIN. (Cf. LÖNNBERG, Journ. f. Orn., 1906, 531; also, PONTOPPIDAN, Danske Atlas, I, 1763, 617, pl. xxv; NILSSON, Orn. Suecica, 1817, 66; BILLBERG, Syn. Faunæ Scand., I, ii, 1828, 115.)

Nos. 372 and 372a will stand as

372. *Glaux acadicus* (GMELIN).

372a. *Glaux acadicus scotæus* (OSGOOD).

GENUS **MEGASCOPS** KAUP. An earlier name is found in

GENUS **OTUS** PENNANT.

Otus PENNANT, Indian Zool., 1769, 3. Type, *Otus bakkamæna*
PENNANT. (Cf. STONE, Auk, 1903, 275; 1907, 192; ALLEN,
Bull. Am. Mus. N. H., XXIV, 1908, 22.)

Nos. 373 to 374a of the Check-List require change as follows:

373. *Otus asio* (LINNÆUS).

373a. *Otus asio floridanus* (RIDGWAY).

373b. *Otus asio mcallii* (CASSIN).

373c. *Otus asio bendirei* (BREWSTER).

373d. *Otus asio kennicottii* (ELLIOT).

373e. *Otus asio maxwelliæ* (RIDGWAY).

373f. *Otus asio cineraceus* (RIDGWAY).

373g. *Otus asio aikenii* (BREWSTER).

373h. *Otus asio macfarlanei* (BREWSTER).

373.1. *Otus trichopsis* (WAGLER).

373.2. *Otus xantusi* (BREWSTER).

374. *Otus flammeola* (KAUP).

374a. *Otus flammeola idahoensis* (MERRIAM).

375b. *Bubo virginianus arcticus* (SWAINSON). This becomes

375b. *Bubo virginianus subarcticus* (HOY).

Bubo subarcticus HOY, Proc. Acad. Nat. Sci. Phila., VI, (1852),
1853, 211.

The name *arcticus* proves to be preoccupied. (Cf. RICHMOND,
Proc. Biol. Soc. Wash., XV, 1902, 86.)

GENUS **CONURUS** KUHL. This becomes

GENUS **CONUROPSIS** SALVADORI.

Conuropsis SALVADORI, Cat. Birds Brit. Mus., XX, 1891, 203.

Type, *Psittacus carolinensis* LINNÆUS. (Cf. ALLEN, Bull. Am. Mus. N. H., XXIV, 1908, 17.)

382. *Conurus carolinensis* (LINNÆUS). Becomes

382. *Conuropsis carolinensis* (LINNÆUS).

GENUS **TROGON** LINNÆUS. Authority changed to

GENUS **TROGON** BRISSON.

Trogon BRISSON, Orn., IV, 1760, 164. Type, *Trogon viridis* LINNÆUS = *T. strigilatus* LINNÆUS. (Cf. STONE, Auk, XXIV, 1907, 192; ALLEN, Bull. Am. Mus. N. H., XXIII, 1907, 340.)

SUBGENUS **STREPTOCERYLE** BONAPARTE. This becomes

SUBGENUS **MEGACERYLE** KAUP.

Megaceryle KAUP, Ver. naturhist. Vereins Hessen, II, 1848, 68.

Type, *Alcedo guttata* BODDAERT = *A. maxima* PALLAS.

Megaceryle has priority over *Streptoceryle*, and should supersede it in the List. (RICHMOND, MS.)

GENUS **CEOPHLÆUS** CABANIS. This is changed to

GENUS **PHLÆOTOMUS** CABANIS.

Phlæotomus CABANIS, Mus. Hein., IV, ii, 1863, 102. Type, *Picus pileatus* LINNÆUS.

Ceophlæus and *Phlæotomus* are held to be generically distinct, and the type of *Ceophloeus* is *Picus lineatus* (an extralimital form), not *P. pileatus* as given in the Check-List. (Cf. STONE, Auk, XXIV, 1907, 197; ALLEN, Bull. Am. Mus. N. H., XXIII, 1907, 342.)

The following changes are required in Nos. 405 and 405a:

405. **Phlœotomus pileatus** (LINNÆUS).
 405a. **Phlœotomus pileatus abieticola** (BANGS).
 408. **Asyndesmus torquatus** (WILSON). This is superseded by
 408. **Asyndesmus lewisi** RILEY.

Asyndesmus lewisi RILEY, Proc. Biol. Soc. Wash., XVIII, 1905, 225. *Picus torquatus* WILSON, 1811, proves to be preoccupied by *Picus torquatus* BODDAERT, 1783.

GENUS **ANTROSTOMUS** GOULD. Authority changed to

GENUS **ANTROSTOMUS** BONAPARTE.

Antrostomus BONAPARTE, Geog. & Comp. List, 1838, 8. Type, *Caprimulgus carolinensis* GMELIN. (Cf. STONE, Auk, XXIV, 1907, 196; ALLEN, Bull. Am. Mus. N. H., XXIV, 1908, 32.) The name was first published by Bonaparte, not Gould.

GENUS **CÆLIGENA** LESSON. This becomes

GENUS **CYANOLÆMUS** STONE.

Cyanolæmus STONE, Auk, XXIV, 1907, 197. Type, *Ornismya clemenciæ* LESSON. (Cf. STONE, Auk, XXIV, 1907, 196; ALLEN, Bull. Am. Mus. N. H., XXIII, 1907, 345.)

The type of *Cœligena* proves to be *Ornismya cœligena*, a member of an extralimital group. The *Cœligena* of the Check-List becomes *Cyanolæmus*, as above, while No. 427 is changed to

427. **Cyanolæmus clemenciæ** (LESSON).

GENUS **IACHE** ELLIOT. This becomes

GENUS **CYNANTHUS** SWAINSON.

Cynanthus SWAINSON, Philos. Mag., N. S., I, June, 1827, 441. Type, *Cynanthus latirostris* SWAINSON. (Cf. STONE, Auk, XXIV, 1907, 192; ALLEN, Bull. Am. Mus. N. H., XXIII, 1907, 347; XXIV, 1908, 34.)

Iache latirostris of the Check-List thus becomes

441. **Cynanthus latirostris** SWAINSON.

No. 441.1 becomes a subspecies of *Platypsaris aglaia*. (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. IV, 1907, 856), viz.:

441.1. **Platypsaris aglaia albiventris** (LAWRENCE).

449. **Pitangus derbianus** (KAUP). This is reduced to a subspecies, as

449. **Pitangus sulphuratus derbianus** (KAUP). (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. IV, 1907, 672.)

453. **Myiarchus mexicanus** (KAUP). This is changed to

453a. **Myiarchus magister nelsoni** RIDGWAY.

Myiarchus magister nelsoni RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. IV, 1907, 903.

Myiarchus mexicanus of Kaup proves to be equivalent to *M. cinerascens*, which name, having priority, is retained. (Cf. OSGOOD, Auk, XXIV, 1907, 219, 220.)

No. 453a of the Check-List becomes

453. **Myiarchus magister** (RIDGWAY).

GENUS **SAYORNIS** BONAPARTE. Authority changed to

GENUS **SAYORNIS** G. R. GRAY.

Sayornis GRAY, Cat. Genera Birds, 1855, 146. Type, *Muscicapula saya* BONAPARTE. (Cf. STONE, Auk, XXIV, 1907, 196.)

GENUS **CONTOPUS** CABANIS. This is preoccupied, and becomes

GENUS **MYIOCHANES** CABANIS & HEINE.

Myiochanes CABANIS & HEINE, Mus. Hein., II, 1859, 71.

Type, *Platyrhynchus cinereus* SPIX. (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. IV, 1907, 509.)

Myiochanes cinereus (SPIX) is held to be congeneric with the Wood Pewee and its allies, and *Myiochanes* is therefore available for this group in place of *Contopus*.

Nos. 460 to 462a of the Check-List thus become

- 460. **Myiochanes pertinax pallidiventris** (CHAPMAN).
- 461. **Myiochanes virens** (LINNÆUS).
- 462. **Myiochanes richardsonii** (SWAINSON).
- 462a. **Myiochanes richardsonii peninsulæ** (BREWSTER).
- 464.1. **Empidonax cineritius** Brewster. This becomes a subspecies of *E. difficilis*, and will stand as
- 464a. **Empidonax difficilis cineritius** (BREWSTER). (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. IV, 1907, 580.)
- 469.1. **Empidonax canescens** SALVIN & GODMAN. This again becomes
- 469.1. **Empidonax griseus** BREWSTER.

Empidonax griseus BREWSTER, Auk, VI, April, 1889, 87 (author's edition published Jan. 31, 1889). (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. IV, 1907, 570; NELSON, Auk, XXIV, 1907, 99, 100.)

GENUS **ORNITHION** HARTLAUB. This becomes

GENUS **CAMPTOSTOMA** SCLATER.

Camptostoma SCLATER, Proc. Zool. Soc. Lond., 1857, 203. Type, *Camptostoma imberbe* SCLATER. (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. IV, 1907, 411.) *Ornithion* is restricted to an extralimital group.

No. 472 should therefore stand as follows:

- 472. **Camptostoma imberbe** (SCLATER).
- [493.] **Sturnus vulgaris** LINNÆUS. The brackets are to be removed, as the species is now believed to occur more or less regularly in Greenland. (Cf. SCHALOW, Vögel Arktis, 1904, 243.)

GENUS **CALLOTHRUS** CASSIN. This, following the law of priority, is changed to

GENUS **TANGAVIUS** LESSON.

Tangavius LESSON, *Revue Zool.*, II, 1839, 41. Type, *Tangavius involucratus* LESSON. (*Cf.* NELSON, *Proc. Biol. Soc. Wash.*, XVIII, 1905, 125.)

The name *Tangavius* is equivalent to *Callothrus*, and has priority.

No. 496 becomes a subspecies, under the name

496. **Tangavius æneus involucratus** (LESSON).

Tangavius involucratus LESSON, *Revue Zool.*, II, 1839, 41. (*Cf.* NELSON, *l. c.*)

501*b*. **Sturnella magna neglecta** (AUDUBON). This becomes a full species:

501.1. **Sturnella neglecta** AUDUBON. (*Cf.* RIDGWAY, *Bull. U. S. Nat. Mus.*, No. 50, Pt. II, 1902, 365.)

[502.] **Icterus icterus** (LINNÆUS). This is transferred to the Hypothetical List, as No. 16.3.

GENUS **PASSERINA** VIEILLOT. This again becomes

GENUS **PLECTROPHENAX** STEJNEGER.

Plectrophenax STEJNEGER, *Proc. U. S. Nat. Mus.*, V, 1882, 33. Type, *Emberiza nivalis* LINNÆUS. (*Cf.* STONE, *Auk*, XXIV, 1907, 199; ALLEN, *Bull. Am. Mus. N. H.*, XXIV, 1908, 23.)

Nos. 534, 534*a*, and 535 thus stand as given in both editions of the Check-List, viz.:

534. **Plectrophenax nivalis** (LINNÆUS).

534*a*. **Plectrophenax nivalis townsendi** RIDGWAY.

535. **Plectrophenax hyperboreus** RIDGWAY.

546. *Coturniculus savannarum passerinus* (WILSON). This becomes

546. *Coturniculus savannarum australis* (MAYNARD).

Ammodromus australis MAYNARD, Amer. Exch. and Mart, III, 1887, 33.

The name *passerinus* (*Fringilla passerina* WILSON, 1811), hitherto applied to this species, proves to be preoccupied, and the above change becomes necessary. (See also, reference under the next case.) (RICHMOND, MS.)

560. *Spizella socialis* (WILSON). An earlier name is found in

560. *Spizella passerina* (BECHSTEIN).

Fringilla passerina BECHSTEIN, in LATHAM, Allg. Ueb. Vögel, III, ii, 1798, 544, pl. 120, f. I.

Bechstein's name *Fringilla passerina*, accompanied by a plate and description, antedates by several years the name *F. socialis* WILSON, applied to the same species. (RICHMOND, MS.)

No. 560a requires the following change:

560a. *Spizella passerina arizonæ* (COUES).

Changes in status become necessary in the following Juncos:

567.1. *Junco montanus* RIDGWAY. Becomes

567f. *Junco hyemalis montanus* (RIDGWAY).

568. *Junco mearnsi* RIDGWAY. This becomes

567g. *Junco hyemalis mearnsi* (RIDGWAY).

568.1. *Junco annectens* BAIRD. Becomes

567h. *Junco hyemalis annectens* (BAIRD).

571.1. *Junco townsendi* ANTHONY. This is changed to

567i. *Junco hyemalis townsendi* (ANTHONY).

569. *Junco caniceps* (WOODHOUSE). Becomes

570b. *Junco phænotus caniceps* (WOODHOUSE).

574a. *Amphispiza belli nevadensis* (RIDGWAY). This is accorded specific rank, as

574.1. *Amphispiza nevadensis* (RIDGWAY). (Cf. GRINNELL, Auk, 1898, 59.)

574b. *Amphispiza belli cinerea* TOWNSEND. This becomes a subspecies of *A. nevadensis*, viz.:

574.1a. *Amphispiza nevadensis cinerea* (TOWNSEND).

The Song Sparrows again become subspecies of *Melospiza melodia*, by reason of the preoccupation of *Fringilla cinerea* GMELIN. They will stand as follows:

581. *Melospiza melodia* (WILSON).

581a. *Melospiza melodia fallax* (BAIRD).

581b. *Melospiza melodia montana* (HENSHAW).

581c. *Melospiza melodia heermanni* (BAIRD).

581d. *Melospiza melodia samuelis* (BAIRD).

581e. *Melospiza melodia morphna* OBERHOLSER.

581f. *Melospiza melodia rufina* (BONAPARTE).

581g. *Melospiza melodia rivularis* (W. BRYANT).

581h. *Melospiza melodia graminea* (C. H. TOWNSEND).

581i. *Melospiza melodia clementæ* (C. H. TOWNSEND).

581j. *Melospiza melodia juddi* (BISHOP).

581k. *Melospiza melodia merrilli* (BREWSTER).

581l. *Melospiza melodia pusillula* (RIDGWAY).

581m. *Melospiza melodia cooperi* (RIDGWAY).

581n. *Melospiza melodia caurina* (RIDGWAY).

581o. *Melospiza melodia kenaiensis* RIDGWAY.

581p. *Melospiza melodia cleonensis* MCGREGOR.

581q. *Melospiza melodia insignis* (BAIRD). (No. 581.1 of Check-List.)

581r. *Melospiza melodia sanaka* (MCGREGOR). (No. 582 of the Check-List.)

Melospiza sanaka MCGREGOR, Condor, III, 1901, 8 (author's edition, published Nov. 25, 1900).

Fringilla cinerea GMELIN, 1788, proves to be preoccupied by *Fringilla cinerea* MEUSCHEN, 1787, and can no longer be used for the Aleutian Song Sparrow, which becomes *M. m. sanaka*, as above. (RICHMOND, MS.) The nomenclatural result of this change is to bring the entire series of Song Sparrows again under *Melospiza melodia*, as subspecies.

The following changes become necessary in the genus **Pipilo**:

588a. **Pipilo maculatus megalonyx** (BAIRD). Changed to

588a. **Pipilo maculatus montanus** SWARTH.

Pipilo maculatus montanus SWARTH, Condor, VII, 1905, 172.
(Cf. RIDGWAY, Condor, VIII, 1906, 100.)

588d. **Pipilo maculatus atratus** RIDGWAY. This becomes

588d. **Pipilo maculatus megalonyx** (BAIRD).

Pipilo megalonyx BAIRD, Reports Expl. & Surv. R. R. Pac.,
IX, 1858, 515. (Cf. RIDGWAY, Condor, VIII, 1906, 100.)

591b. **Pipilo fuscus crissalis** (VIGORS). This becomes a full species:

591.1. **Pipilo crissalis** (VIGORS). (Cf. RIDGWAY, Bull. U. S.
Nat. Mus., No. 50, Pt. I, 1901, 434.)

No. 591c of the Check-List becomes

591.1a. **Pipilo crissalis senicula** (ANTHONY).

GENUS **CYANOSPIZA** BAIRD. This again becomes

GENUS **PASSERINA** VIEILLOT.

Passerina VIEILLOT, Analyse, 1816, 30. Type, *Tanagra cyanea* LINNÆUS. (Cf. STONE, Auk, XXIV, 1907, 199;
ALLEN, Bull. Am. Mus. N. H., XXIV, 1908, 37.)

Nos. 598 to 601 thus stand as given in the first and second editions of the Check-List, viz.:

598. **Passerina cyanea** (LINNÆUS).

599. *Passerina amœna* (SAY).
600. *Passerina versicolor* (BONAPARTE).
600a. *Passerina versicolor pulchra* RIDGWAY.
601. *Passerina ciris* (LINNÆUS).
602. *Sporophila morelleti* (BONAPARTE). This again becomes
602. *Sporophila morelleti sharpei* LAWRENCE.

Sporophila morelleti sharpei LAWRENCE, Auk, VI, 1889, 53. (*Cf.* ALLEN, Auk, XXIV, 1907, 26-30.) No. 602 thus stands as given in the second edition of the Check-List.

FAMILY **TANAGRIDÆ**. This is changed to

FAMILY **TANGARIDÆ**.

Tangara BRISSON, 1760, antedates and preoccupies *Tanagra* LINNÆUS, 1764. Even if the two terms be considered distinct, *Tanagra* of Linnæus at 1764 becomes either a synonym of *Euphonia* DESMAREST, or a member of the family Icteridæ, and is thus not available for the generic name of a group of Tanagers, nor as the basis of the family name.

FAMILY **AMPELIDÆ**. becomes

FAMILY **BOMBYCILLIDÆ**.

GENUS **AMPELIS** LINNÆUS. This becomes

GENUS **BOMBYCILLA** VIEILLOT.

Bombycilla VIEILLOT, Ois. Amer. Sept., I, 1807, 88. Type,
Bombycilla cedrorum VIEILLOT.

The name *Ampelis* is not available for use in this family, belonging properly to the Cotingidæ. (*Cf.* ALLEN, Bull. Am. Mus. N. H., XXIV, 1908, 12.)

Agreeable to the above changes, Nos. 618 and 619 become

618. *Bombycilla garrula* (LINNÆUS).
619. *Bombycilla cedrorum* VIEILLOT.

The following changes are made in the family Vireonidæ:

SUBGENUS **VIREOSYLVA** BONAPARTE. This becomes

GENUS **VIREOSYLVA** BONAPARTE.

Vireosylva BONAPARTE, Geog. & Comp. List, 1838, 26.

Type, *Muscicapa olivacea* LINNÆUS. (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. III, 1904, 130.)

Nos. 623 to 627*a* thus stand as

623. *Vireosylva calidris barbatula* (CABANIS).

624. *Vireosylva olivacea* (LINNÆUS).

625. *Vireosylva flavoviridis* CASSIN.

626. *Vireosylva philadelphica* CASSIN.

627. *Vireosylva gilva* (VIEILLOT).

627*a*. *Vireosylva gilva swainsonii* (BAIRD).

SUBGENUS **LANIVIREO** BAIRD. This becomes

GENUS **LANIVIREO** BAIRD.

Lanivireo BAIRD, Review Amer. Birds, 1866, 326, 345. Type,

Vireo flavifrons VIEILLOT. (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. III, 1904, 161.)

The following alterations become necessary in Nos. 628 to 629*d*:

628. *Lanivireo flavifrons* (VIEILLOT).

629. *Lanivireo solitarius* (WILSON).

629*a*. *Lanivireo solitarius cassinii* (XANTUS).

629*b*. *Lanivireo solitarius plumbeus* (COUES).

629*c*. *Lanivireo solitarius alticola* (BREWSTER).

629*d*. *Lanivireo solitarius lucasanus* (BREWSTER).

The genus **Vireo**, as represented in the Check-List, is restricted to Nos. 630 to 634.

631. **Vireo noveboracensis** (GMELIN). An earlier name is found in

631. **Vireo griseus** (BODDAERT).

Tanagra grisea BODDAERT, Table Pl. Enl., 1783, 45. (RICHMOND, MS.)

Nos. 631a, 631b, and 631c thus become

631a. **Vireo griseus maynardi** (BREWSTER).

631b. **Vireo griseus bermudianus** (BANGS & BRADLEE).

631c. **Vireo griseus micrus** (NELSON).

633.1. **Vireo pusillus** COUES. This is again reduced to sub-specific rank, and will stand as

633a. **Vireo bellii pusillus** (COUES). (Cf. OBERHOLSER, Proc. Biol. Soc. Wash., XVI, 1903, 17, 18; RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. III, 1904, 208.)

SUBGENUS **PEUCEDRAMUS** COUES. This becomes

GENUS **PEUCEDRAMUS** "COUES" HENSHAW.

Peucedramus HENSHAW, Ann. Rept. Geog. Expl. West of 100th Merid., 1875, 156. Type, *Sylvia olivacea* GIRAUD. (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. II, 1902, 493; CHAPMAN, Warblers of N. A., 1907, 110.)

No. 651 thus becomes

651. **Peucedramus olivaceus** (GIRAUD).

657. **Dendroica maculosa** (GMELIN). This is changed to

657. **Dendroica magnolia** (WILSON).

Sylvia magnolia WILSON, Amer. Orn., III, 1811, 63, pl. 23, f. 2.

Motacilla maculosa GMELIN, 1788, proves to be preoccupied by *Motacilla maculosa* BODDAERT, 1783, and *Sylvia magnolia* WILSON, as the next available name, is substituted for it. (RICHMOND, MS.)

SUBGENUS **OPORORNIS** BAIRD. This is elevated to generic rank,
as

GENUS **OPORORNIS** BAIRD.

Oporornis BAIRD, Rep. Expl. & Surv. R. R. Pac., IX, 1858, 246. Type, *Sylvia agilis* WILSON. (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. II, 1902, 621; CHAPMAN, Warblers of N. A., 1907, 235.)

Oporornis includes Nos. 677 to 680, which will stand as follows:

677. *Oporornis formosa* (WILSON).

678. *Oporornis agilis* (WILSON).

679. *Oporornis philadelphia* (WILSON).

680. *Oporornis tolmiei* (TOWNSEND).

The genus *Geothlypis* is restricted (in North America) to *Geothlypis trichas* and subspecies, and *G. beldingi*.

SUBGENUS **CHAMÆTHLYPIS** RIDGWAY. This becomes

GENUS **CHAMÆTHLYPIS** RIDGWAY.

Chamæthlypis RIDGWAY, Man. N. A. Birds, 1887, 525. Type, *Geothlypis poliocephala* BAIRD. (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. II, 1902, 686; CHAPMAN, Warblers of N. A., 1907, 263.)

No. 682.1 thus becomes

682.1. *Chamæthlypis poliocephala* (BAIRD).

684. *Wilsonia mitrata* (GMELIN). An earlier name is found in

684. *Wilsonia citrina* (BODDAERT).

Muscicapa citrina BODDAERT, Table Pl. Enl., 1783, 41.
(RICHMOND, MS.)

697. *Anthus pensilvanicus* (LATHAM). An earlier name occurs in

697. *Anthus rubescens* (TUNSTALL).

Alauda rubescens TUNSTALL, Orn. Britannica, 1771, 2.
(RICHMOND, MS.)

GENUS **CINCLUS** BECHSTEIN. Authority is changed to

GENUS **CINCLUS** BORKHAUSEN.

Cinclus BORKHAUSEN, Deutsche Fauna, I, 1797, 300. Type,
Cinclus hydrophilus BORKHAUSEN = *Sturnus cinclus* LINNÆUS. (Cf. ALLEN, Bull. Am. Mus. N. H., XXIII, 1907, 372.)

701. **Cinclus mexicanus** SWAINSON. This becomes

701. **Cinclus mexicanus unicolor** (BONAPARTE).

Cinclus unicolor BONAPARTE, Zool. Journ., III, 1827, 52, 53.
(Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. III, 1904, 679.)

GENUS **GALEOSOPTES** CABANIS. By reason of priority this is changed to

GENUS **DUMETELLA** S. D. W.

Dumetella S. D. W., Analyst, V, 1837, 206. Type, *Turdus felivox* VIEILLOT = *Muscicapa carolinensis* LINNÆUS. (Cf. STONE, Auk, XXIV, 1907, 193; ALLEN, Bull. Am. Mus. N. H., XXIV, 1908, 17.)

704. **Galeoscoptes carolinensis** (LINNÆUS). This becomes

704. **Dumetella carolinensis** (LINNÆUS).

719b. **Thryomanes bewickii leucogaster** (BAIRD). This is again changed to

719b. **Thryomanes bewickii bairdi** (SALVIN & GODMAN).

Thryothorus bairdi SALVIN & GODMAN, Biol. Centr.-Amer., Aves., I, April, 1880, 95. (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. III, 1904, 560.) The change is made on the ground that *Thryothorus bewickii leucogaster* of Baird was not intended as a new name, but simply as *Troglodytes leucogaster* GOULD, placed in the genus *Thryothorus*, Baird being under the impression that *T. leucogaster* GOULD represented the present form, instead of a bird of an entirely different genus.

GENUS **OLBIORCHILUS** OBERHOLSER. This is replaced by

GENUS **NANNUS** BILLBERG.

Nannus BILLBERG, Syn. Faunæ Scand., I, ii, 1828, table A, and p. 57. Type, *Motacilla troglodytes* LINNÆUS. (Cf. STONE, Auk, XXIV, 1907, 194; ALLEN, Bull. Am. Mus. N. H., XXIV, 1908, 21.)

Nos. 722 to 723.1 of the Check-List will thus become

- 722. **Nannus hiemalis** (VIEILLOT).
- 722a. **Nannus hiemalis pacificus** (BAIRD).
- 722b. **Nannus hiemalis helleri** (OSGOOD).
- 723. **Nannus alascensis** (BAIRD).
- 723.1. **Nannus meligerus** (OBERHOLSER).

GENUS **PARUS** LINNÆUS. This becomes

GENUS **PENTHESTES** REICHENBACH.

Penthestes REICHENBACH, Avium Syst. Nat., 1850, pl. LXII, fig. Type, *Parus lugubris* TEMMINCK. (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. III, 1904, 394.)

Nos. 735 to 741b of the List will thus stand as follows:

- 735. **Penthestes atricapillus** (LINNÆUS).
- 735a. **Penthestes atricapillus septentrionalis** (HARRIS).
- 735b. **Penthestes atricapillus occidentalis** (BAIRD).
- 735c. **Penthestes atricapillus turneri** (RIDGWAY).
- 736. **Penthestes carolinensis** (AUDUBON).
- 736a. **Penthestes carolinensis agilis** (SENNETT).
- 736b. **Penthestes carolinensis impiger** (BANGS).
- 737. **Penthestes sclateri** (KLEINSCHMIDT).
- 738. **Penthestes gambeli** (RIDGWAY).

- 738a. *Penthestes gambeli baileyæ* (J. GRINNELL).
- 739. *Penthestes cinctus alascensis* (PRAZAK).
- 740. *Penthestes hudsonicus* (FORSTER).
- 740a. *Penthestes hudsonicus littoralis* (H. BRYANT).
- 741. *Penthestes rufescens* (J. K. TOWNSEND).
- 741a. *Penthestes rufescens neglectus* (RIDGWAY).
- 741b. *Penthestes rufescens barlowi* (J. GRINNELL).
- 760. *Turdus iliacus* LINNÆUS. This becomes
- 760. *Turdus musicus* LINNÆUS.

Turdus musicus LINNÆUS, Syst. Nat., ed. 10, I, 1758, 169.

The names *iliacus* and *musicus*, as usually understood, should be reversed and cited from the 10th edition of the Systema Naturæ, and No. 760 of the Check-List should stand as *T. musicus*. (Cf. HARTERT, Ibis, 1904, 431.) The names were reversed by Linnæus in Faun. Suec., ed. 2, 1761, and in Syst. Nat., ed. 12.

GENUS **MERULA** LEACH. This is changed to

GENUS **PLANESTICUS** BONAPARTE.

Planesticus BONAPARTE, Comptes Rendus, XXXVIII, 1854, 3.
Type, *Turdus lereboulleti* BONAPARTE = *Turdus jamaicensis* GMELIN. (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. IV, 1907, 90.)

Merula LEACH, 1816, proves to be antedated by *Merula* KOCH, 1816, for a group of Starlings.

The following changes are necessary in Nos. 761 to 762.

- 761. *Planesticus migratorius* (LINNÆUS).
- 761a. *Planesticus migratorius propinquus* (RIDGWAY).
- 761b. *Planesticus migratorius achrusterus* (BACHELDER).
- 762. *Planesticus confinis* (BAIRD).

GENUS **CYANECULA** BREHM.¹ An earlier name occurs in

GENUS **CYANOSYLVIA** BREHM.

Cyanosylvia BREHM, Isis, XXI, 1828, 920. Type, *Motacilla suecica* LINNÆUS. (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. IV, 1907, 14.)

764. **Cyanecula suecica** (LINNÆUS). This is changed to

764. **Cyanosylvia suecica robusta** (BUTURLIN).

Siberian Red-spotted Bluethroat.

Cyanecula suecica robusta BUTURLIN, Orn. Monatsb., XV, 1907, 79. (Cf. BUTURLIN, Auk, XXV, 1908, 35; RIDGWAY, t. c., 226.)

766a. **Sialia sialis azurea** (BAIRD). This becomes

766a. **Sialia sialis fulva** BREWSTER.

Sialia sialis fulva BREWSTER, Auk, II, 1885, 85.

Sialia azurea SWAINSON, 1827, was not a *nomen nudum*, as usually supposed, but a substitute name for *Sialia sialis*; it is therefore not available for the Azure Bluebird, the earliest name for which appears to be *fulva*, as above. (RICHMOND, MS.)

768. **Sialia arctica** (SWAINSON). A much earlier name occurs in

768. **Sialia currucoides** (BECHSTEIN).

Motacilla s. Sylvia currucoides BECHSTEIN, in LATHAM, Allg. Ueb. Vögel, III, ii, 1798, 546, pl. 121.

Swainson described and figured the Arctic Bluebird in 1831, and his name, "*Erythaca (Sialia) arctica*" is generally supposed to have been the earliest reference to the species. It is now found, however, that Bechstein gave a description and colored figure of this species in 1798, under the name *Motacilla s. Sylvia currucoides*, which name is accordingly adopted. (RICHMOND, MS.)

IV. PROPOSED ADDITIONS AND CHANGES NOT ACCEPTED.

Gavia vs. *Colymbus* (cf. STONE, Auk, 1907, 199). A change in this case is obviated by the application of Rule 30 of the new International Code, now incorporated into the revised A. O. U. Code.

Colymbus vs. *Podiceps* (cf. STONE, Auk, 1907, 199). The proposed change is unnecessary, being based on the now obsolete "first species" rule.

Dytes vs. *Proctopus* (cf. COUES, Osprey, III, 1899, 144). The proposed change is not adopted, since *Proctopus* is a synonym of *Dytes*.

Pseuduria COUES (cf. COUES, Osprey, III, 1899, 144.) The characters of this proposed subgenus are considered too slight for inclusion in the List.

Megalestris vs. *Catharacta* (cf. POCHÉ, Orn. Monatsb., 1904, 23). *Catharacta* has been used for several groups of birds, under various spellings, the first use of one of its variants being for a genus of Penguins, which renders it unavailable for the present genus (cf. ALLEN, Auk, 1904, 345).

Blasipus, *Chroicocephalus*, and *Hydrocolæus* (cf. COUES, Osprey, III, 1899, 144). These proposed subgenera of *Larus* are not adopted, being chiefly based upon pattern of coloration.

Subgenus **Thalasseus** vs. genus *Hydroprogne* (cf. SALVIN & GODMAN, Biol. Centr.-Amer., Aves, III, 1903, 401). Recognition as a genus not considered desirable; furthermore, *Thalasseus* is the proper name for the group. (Cf. ALLEN, Bull. Am. Mus. N. H., XXIV, 1908, 10, 39.)

Thalassogeron vs. *Diomedea* (cf. ROTHSCHILD, Bull. Brit. Orn. Club, XV, 1904, 45). No reasons have been offered for the proposed change.

Oceanodroma beali EMERSON, Condor, VIII, 1906, 54.

Oceanodroma beldingi EMERSON, Condor, VIII, 1906, 54. This and the preceding appear to be indistinguishable from *O. leucorhoa*.

Oceanodroma monorhis chapmani BERLEPSCH, Auk, XXIII, 1906, 185. This proves to be a phase of plumage of *O. socorroensis*.

Dilophalieu (cf. COUES, Key, 5th ed., 1903, 962). Not admitted, the proposed subgenus being based on insufficient characters.

Viguacarbo (cf. COUES, Key, 5th ed., 1903, 963). The characters of this proposed subgenus are not deemed sufficient for recognition in the List.

127. **Pelecanus californicus** vs. *P. fuscus* [= *occidentalis*] *californicus* (cf. RIDGWAY, Proc. U. S. Nat. Mus., XIX, 1897, 593; HARTERT, Nov. Zool., VI, 1899, 176; Twelfth Supplement, Auk, 1903, 363).

A change in status is considered unnecessary.

Merganser vs. *Serrator* (cf. STONE, Auk, 1907, 194). No change required. (See under 'Changes in Nomenclature,' *antea*, p. 360.)

160. **Somateria dresseri** vs. *S. mollissima dresseri* (cf. HARTERT, Bull. Brit. Orn. Club, XV, 1904, 44). The change is deemed unnecessary at present.

Melanitta vs. *Phaonetta* (cf. STONE, Auk, 1907, 198). Proposed change based on the "first species" rule.

Exanthemops vs. full genus (cf. Twelfth Supplement, Auk, 1903, 368). Elevation to generic rank not considered desirable.

- 171.2. **Anser brachyrhynchus** vs. *Melanonyx brachyrhynchus*, and [171.1.] **Anser fabalis** vs. *Melanonyx segetum* (cf. BUTURLIN, Wild Geese Russian Empire, 1901, 22; SALVADORI, Ibis, 1905, 530). *Melanonyx* is not thought worthy of recognition, being based on slight characters, and *fabalis*, as the specific name of the Bean Goose, has priority over *segetum*.

Plegadis vs. *Egatheus* (cf. LÖNNBERG, Journ. f. Orn., 1906, 533):

No change required, since *Egatheus* proves to be a substitute name for *Ibis* LACÉPÈDE, an Old World genus.

202. **Nycticorax nycticorax nævius** vs. *N. n. griseus* (cf. DUBOIS, Syn. Avium, 1903, 917). A change proves to be unnecessary, since it is found that *grisea* was based on a young bird, without locality, but probably from Europe, from which the American bird is held to be subspecifically distinct.

Coturnicops vs. *Ortygops* (cf. Twelfth Supplement, Auk, 1903, 368). *Ortygops* proves to be a pure synonym of *Coturnicops*, hence no change is required.

Ionornis vs. *Porphyriola* (cf. GODMAN & SHARPE, Biol. Centr.-Amer., Aves, III, 1903, 327).

The proposed change is not accepted, as there is a question of priority between the two names, and the type species of *Porphyriola* was a *nomen nudum* until 1852.

256. **Helodromas solitarius** vs. *Rhyacophilus solitarius* (cf. OBERHOLSER, Proc. U. S. Nat. Mus., XXVIII, 1905, 838). A change is considered unnecessary.

Actitis vs. *Tringoides* (cf. STONE, Auk, 1907, 198). No change required, the proposed innovation being based on the "first species" rule.

Ægialeus (cf. COUES, Key, 5th ed., 1903, 775). Not accepted; based on characters too slight for recognition.

Colinus virginianus insularis HOWE, Proc. Biol. Soc. Wash., XVII, 1904, 168. Based in all probability upon a straggler from the mainland of Florida, and the characters ascribed are too slight for admittance to the List.

Lophortyx catalinensis GRINNELL, Auk, 1906, 262. Considered as unworthy of recognition, the characters given for the insular bird being intermediate between those of allied forms from the mainland.

Bonasa vs. *Hylobrontes* (cf. STONE, Auk, 1907, 198). Proposed change based on the now rejected "first species" rule.

Tympanuchus vs. *Bonasa* (cf. STONE, Auk, 1907, 198). Proposed change rejected, for reasons given under the preceding case.

315. **Ectopistes migratorius** vs. *E. macroura* (cf. BANGS, Proc. Biol. Soc. Wash., XIX, 1906, 44). Not adopted, the proposed change, in the opinion of the Committee, being based on false reasoning (see 'Changes in Nomenclature,' under No. 316).

Cathartes vs. *Rhinogryphus* (cf. STONE, Auk, 1907, 198). Proposed change based on the "first species" rule, hence not accepted.

Tachytriorchis vs. full genus (cf. Twelfth Supplement, Auk, 1903, 368). The proposed change in status considered unnecessary.

Hierofalco vs. full genus (cf. Twelfth Supplement, Auk, 1903, 368). The requirements of this case are believed to be fully met by retaining *Hierofalco* as a subgenus.

Rhynchofalco vs. *Hypotriorchis*, and as full genus (cf. DUBOIS, Syn. Avium, 1902, 872). Not considered worthy of generic rank, and *Hypotriorchis* and *Rhynchofalco* are deemed to be subgenerically distinct.

Asio vs. *Nyctalops* (cf. STONE, Auk, 1903, 275). No change required.

Psiloscops (cf. COUES, Osprey, III, 1899, 144). Not accepted, the proposed subgenus possessing no characters worthy of recognition.

Bubo vs. *Asio* (cf. STONE, Auk, 1903, 275). No change required.

375. **Bubo virginianus** vs. *Asio* [= *Bubo*] *magellanicus virginianus* (cf. OBERHOLSER, Proc. U. S. Nat. Mus., XXVII, 1904, 179, 188). No change required, as *Strix magellanicus* proves not to have been used in a systematic sense by Gmelin.

Asio [= *Bubo*] *magellanicus icelus* OBERHOLSER, Proc. U. S. Nat. Mus., XXVII, 1904, 185.

Asio [= *Bubo*] *magellanicus lagophonus* OBERHOLSER, Proc.

U. S. Nat. Mus., XXVII, 1904, 185. These two forms not admitted, being too close to *B. v. saturatus* for recognition as independent subspecies.

Bubo virginianus occidentalis (cf. OBERHOLSER, Proc. U. S. Nat. Mus., XXVII, 1904, 191). Not admitted, for reasons given in the Eighth Supplement, Auk, 1897, 132.

375b. *Bubo virginianus subarcticus* vs. *Asio magellanicus wapacuthu* (cf. OBERHOLSER, Proc. U. S. Nat. Mus., XXVII, 1904, 191). This proposed change not adopted, since *Strix wapacuthu* was based on a young bird, not with certainty identifiable.

[377.] *Surnia ulula* vs. *S. funerea* (cf. OBERHOLSER, Proc. Biol. Soc. Wash., XIX, 1906, 42). No action necessary (see 'Changes in Nomenclature,' under No. 371).

[377.] *Surnia ulula* vs. *S. u. doliata* (cf. SHARPE, Hand-List, I, 1899, 296). With the material at its command, the Committee cannot distinguish this form, the proper name for which, if recognizable, will be *S. u. pallasi* BUTURLIN.

Glaucidium vs. *Noctua* (cf. STONE, Auk, 1907, 192). Proposed change not accepted, since *Noctua* of S. G. Gmelin proves to be referable to the Short-eared Owl (cf. STONE, Auk, 1908, 221).

396a. *Dryobates scalaris lucasanus* vs. *D. lucasanus* (cf. BREWSTER, Bull. Mus. Comp. Zool., XLI, 1902, 102). Recent material from Lower California has convinced the Committee that a change is unnecessary.

Picoides arcticus tenuirostris BANGS, Auk, 1900, 131. Not accepted; the characters ascribed to this form appear to be too slight for recognition.

403. *Sphyrapicus ruber* vs. *S. r. daggetti* (cf. ANDERSON & GRINNELL, Proc. Acad. Nat. Sci. Phila., 1903, 8). Again rejected, for reasons given in the Eleventh Supplement (Auk, 1902, 334).

Melanerpes formicivorus aculeatus (cf. SWARTH, Pac. Coast

Avif., No. 4, 1904, 13). On reconsideration the former decision of the Committee was reaffirmed.

Contopus richardsonii saturatus BISHOP, Auk, 1900, 116. Not accepted, the alleged characters proving of no value.

Otocoris alpestris aphrasta OBERHOLSER, Proc. U. S. Nat. Mus., XXIV, 1902, 860. Considered to be extralimital.

Cyanocitta stelleri borealis CHAPMAN, Bull. Am. Mus. N. H., XVI, 1902, 240. Not admitted, for reasons expressed in the former ruling of the Committee (Auk, 1903, 362).

Stellerocitta and *Sieberocitta* (cf. COUES, Key, 5th ed. 1903, 495, 499). These proposed subgenera are not accepted, having been based on color characters alone.

Perisoreus vs. *Cractes* (cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. III, 1904, 750). *Cractes* proves to be simply a substitute name for *Garrulus* BRISSON, and does not enter the Check-List.

Corvus corax clarionensis ROTHSCHILD & HARTERT, Nov. Zool., IX, 1902, 381. (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. III, 1904, 264.) Believed to be not sufficiently distinct for recognition, so far as the alleged form occurs within our limits.

489. **Corvus caurinus** vs. *C. brachyrhynchos caurinus* (cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. III, 1904, 746). The proposed change in the status of this form is considered unwarranted at present.

Loxia curvirostra bendirei (cf. MERRIAM, N. A. Fauna, No. 16, 1899, 123; RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. I, 1901, 50). Not accepted, there being apparently no well-defined range for the supposed form.

523. **Leucosticte griseonucha** vs. *L. tephrocotis griseonucha* (cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. I, 1901, 72). Without clear proof of intergradation, a change in status in this case is deemed to be undesirable.

528. **Acanthis linaria** vs. *A. flammea* (cf. HARTERT, Vögel pal. Fauna, I, 1903, 77). No change required (cf. HARTERT, Orn. Monatsb., 1907, 97).

550a. **Ammodramus maritimus peninsulae** and 550c, **A. m. fisheri** vs. *A. m. macgillivraii* (cf. WAYNE, Auk, 1906, 66, 67). These proposed changes seem to be unadvisable at present.

570a. **Junco phænotus dorsalis** vs. *J. dorsalis* (cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. I, 1901, 297). The proposed change is not adopted, since intergradation is believed to occur.

581j. **Melospiza cinerea** [= *melodia*] **juddi**. This proposed elimination from the Check-List (cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. I, 1901, 356) is believed to be unnecessary.

Melospiza coronatorum GRINNELL & DAGGETT, Auk, 1903, 34. This is thought to be equivalent to *M. melodia clementæ*, and is not admitted.

583a. **Melospiza lincolni striata** vs. *M. l. gracilis* KITTLITZ (cf. OBERHOLSER, Proc. Biol. Soc. Wash., XIX, 1906, 42). Not accepted, Kittlitz's description being too brief to permit of certain identification.

585d. **Passerella iliaca stephensi** vs. *Passerella stephensi* (cf. GRINNELL, Auk, 1905, 388). The proposed change in status appears to be unwarranted.

Passerella iliaca annectens RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. I, 1901, 30, and

Passerella iliaca annectens vs. *P. i. meruloides* (cf. GRINNELL, Condor, IV, 1902, 45). Both *annectens* and *meruloides* are believed to represent one form; which is inseparable from *P. i. insularis*.

591a. **Pipilo fuscus albigula** vs. *P. albigula* (cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. I, 1901, 433). This proposed change in status is thought unnecessary.

Cardinalis cardinalis magnirostris BANGS, Proc. N. E. Zool. Club, IV, 1903, 6. The characters ascribed to this form are too slight for recognition.

608. *Piranga erythromelas* vs. *P. mexicana* (cf. OBERHOLSER, Proc. Biol. Soc. Wash., XIX, 1906, 43). The proposed change is rejected, on the ground that *mexicana* is based on Seba, whose plate and description are better applicable to *Cardinalis* than to *Piranga*.

632c. *Vireo huttoni obscurus* vs. *V. huttoni* (cf. ANDERSON & GRINNELL, Proc. Acad. Nat. Sci. Phila., 1903, 12). The proposed change in status is believed to be unwarranted.

Vireo bellii arizonæ RIDGWAY, Proc. Biol. Soc. Wash., XVI, 1903, 108. Not admitted, on the ground that it is a synonym of *V. b. pusillus*.

Vireo mailliardorum GRINNELL, Condor, V, 1903, 157. The characters alleged for this form appear to be too slight for recognition.

Vermivora celata orestera OBERHOLSER, Auk, 1905, 243. Not admitted, on the ground of insufficient characters.

Compsothlypis americana ramalinæ RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. II, 1902, 486. Not considered worthy of recognition.

Perissoglossa vs. full genus (cf. MAYNARD, Warblers of New England, 1905, 13). A change in status thought to be inadvisable.

Neodendroica and *Cinerosa* MAYNARD, Warblers of New England, 1901-05, 58, 69, 110. These proposed genera are considered unnecessary, being based upon color characters.

681. *Geothlypis trichas* vs. *G. t. ignota* (cf. CHAPMAN, Auk, 1907, 30-34). The proposed change is believed to be unnecessary.

[695.] *Motacilla ocularis* vs. *M. alba ocularis* (cf. HARTERT, Vögel pal. Fauna, III, 1905, 307). The proposed change in status appears to be unwarranted.

Budytes flavus leucostriatus vs. *B. f. similima* (cf. HARTERT, Vögel pal. Fauna, III, 1905, 289). No change is required, since the Alaskan bird had been previously named *alascensis* by Ridgway, whose name was accepted in the last Supplement (Auk, 1904, 417).

697. *Anthus pensilvanicus* [= *rubescens*] vs. *A. spinoletta pensilvanicus* (cf. HARTERT, Vögel pal. Fauna, III, 1905, 282). Actual intergradation is believed to be unknown.

Toxostoma redivivum helva THAYER & BANGS, Proc. N. E. Zool. Club, IV, 1907, 17. Not deemed sufficiently distinct for recognition.

716. *Salpinctes guadeloupensis* vs. *S. obsoletus guadeloupensis* (cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. III, 1904, 650). The proposed change in status is thought to be inexpedient.

Catherpes mexicanus poliopterus OBERHOLSER, Auk, 1903, 197. This is rejected as being based on intergrades of several adjacent forms.

Thryomanes bewickii cerroensis.

Thryomanes bewickii drymœcus.

Thryomanes bewickii nesophilus.

Thryomanes bewickii eremophilus, and

719.1. *Thryomanes leucophrys* vs. *T. bewickii leucophrys* (cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. III, 1904, 557-563). The proposed additions and change in status are not accepted, for reasons given in the Tenth Supplement (Auk, 1901, 313-314).

Parus (Lophophanes) bicolor floridanus BANGS, Auk, 1898, 181 (cf. HELLMAYR, Tierreich, Lief. 18, 1903, 42). The characters of this form are too slight and inconstant for recognition. The Committee gave an adverse decision also in the Ninth Supplement.

Bæolophus wollweberi annexus (cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. III, 1904, 393). Not admitted, since it proves to be indistinguishable from true *wollweberi*.

736. *Parus* [= **Penthestes**] **carolinensis** vs. *P. atricapillus carolinensis*.
737. *Parus* [= **Penthestes**] **sclateri** vs. *P. palustris sclateri*.
739. *Parus* [= **Penthestes**] **cinctus alascensis** vs. *P. c. obtectus*. (Cf. HARTERT, Vögel pal. Fauna, III, 1905, 376, 366.) A change in status in these forms is believed to be unnecessary.

Psaltriparus minimus saturatus RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. III, 1904, 434. Not admitted, the Committee being unable to find any tangible differences between the proposed new form and *minimus*.

- 743b. *Psaltriparus minimus grindæ* vs. *P. grindæ* (cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. III, 1904, 436). There appear to be no valid reasons for altering the status of this form.

Regulus calendula cineraceus GRINNELL, Condor, VI, 1904, 25. The characters of this proposed form appear to be too indefinite for recognition by name.

- 763a. *Ixoreus naevius meruloides*. Proposed elimination. (Cf. RIDGWAY, Bull. U. S. Nat. Mus., No. 50, Pt. IV, 1907, 134.) Material only recently available appears to support the validity of this form, and the proposed elimination is not accepted.

Sialia sialis grata (cf. HOWE, Contr. N. Am. Orn., 1902, 31). Again rejected, as indistinguishable from *S. sialis*. (Cf. Auk, 1899, 131.)

V. DEFERRED CASES.

Acanthopneuste borealis vs. *A. b. kennicottii*.

Accipiter velox rufilatus RIDGWAY.

Agelaius phœniceus arctolegus OBERHOLSER.

Anas boschas spilogaster SCHIOLER.

Glaucidium phalænoides vs. *G. p. ridgwayi*.

Lagopus rupestris chamberlaini CLARK.

Larus vegæ vs. *L. argentatus*.

Melospiza cinerea phæa FISHER.

Oceanodroma socorroensis vs. *O. monorhis*.

Otocoris alpestris enertera OBERHOLSER.

Speotyto cunicularia becki ROTHSCILD & HARTERT.

Telmatodytes palustris thryophilus OBERHOLSER.

Totanus melanoleucus frazari BREWSTER.

Trochilus vs. *Archilochus*.

Vireo huttoni oberholseri.

The following generic cases have been submitted to the International Zoölogical Commission:

<i>Alca</i>	versus	Plautus.	
Thalasseus	"	<i>Hydroprogne.</i>	
<i>Actocheilidon</i>	"	Thalasseus.	
<i>Rhantistes</i>	"	Fulmarus.	
Herodias	"	<i>Leucophoyx.</i>	
<i>Columbina</i>	"	Chæmepelia.	
<i>Morphnus</i>	"	Urubitinga.	
Catharista	"	_____?	
Ceryle	"	<i>Alcedo</i> (as affected by <i>Ispida</i> BRISSON).	
Acanthis	"	<i>Ægiothus.</i>	
<i>Hortulanus</i>	"	Zonotrichia.	
Helinaia	"	_____?	
Ammodramus	"	<i>Coturniculus.</i>	} Swainsonian genera.
Coturniculus	"	<i>Passerherbulus.</i>	
Tiaris	"	<i>Eutheia.</i>	
Helminthophila	"	<i>Vermivora.</i>	

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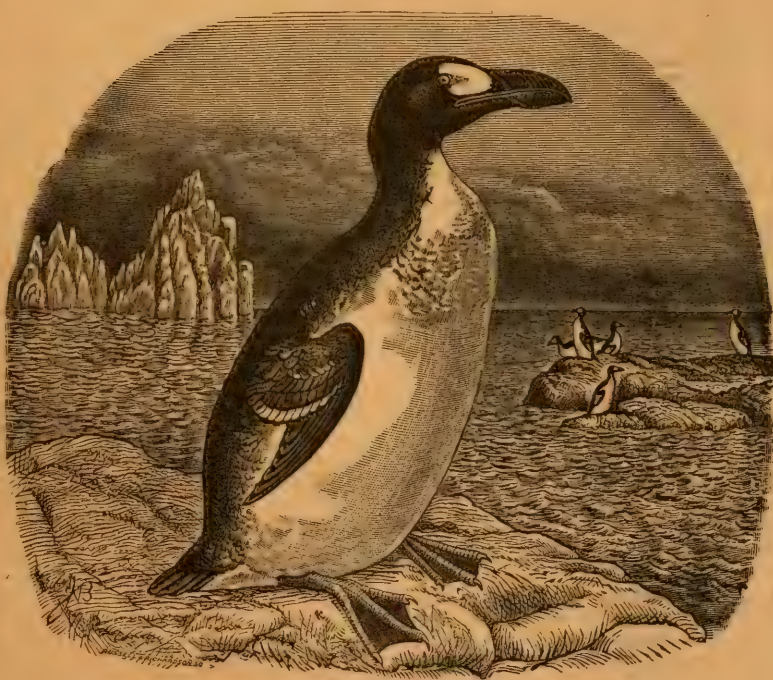
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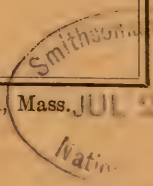


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No. 4.

THE COPPER-PLATES OF THE FOLIO EDITION OF AUDUBON'S 'BIRDS OF AMERICA,' WITH A BRIEF SKETCH OF THE ENGRAVERS.

BY RUTHVEN DEANE.

I.

THE engraving of the copper-plates for the elephant folio edition of the 'Birds of America' occupied the time between 1827 and 1838 when the 435 plates were completed. These plates were afterwards sent to America and stored in a warehouse in New York City. In 1845 many of these plates were seriously damaged by fire. In a letter from Spencer F. Baird to Audubon, dated Carlisle, Penn., August 4, 1845, he writes: "It is with the sincerest regret that I see by the papers that your copper-plates were injured or perhaps ruined by fire which occurred a few weeks ago."

Miss M. R. Audubon informs me that in 1851-52 when her grandfather's new house was built, a fire-proof vault, detached from the other buildings, was put up for them, and there they remained until the death of her father in 1862, when they were sold.

Under date of February 10, 1908, Miss Grace H. Dodge writes me that the plates were stored in the warehouse of Phelps, Dodge and Company, New York, about 1865, and at that time her father, the late William E. Dodge, had them sorted and presented a number of those that were in the best state of preservation to several colleges, museums, friends and members of his family.

The probabilities are that the majority of the plates were shipped from the New York warehouse to the Ansonia Brass and Copper Company, Ansonia, Conn., of which company Mr. Dodge was president, and I am indebted to Mr. Charles A. Cowles, Ansonia, for a most interesting account of how he was the means of saving several of these plates from being thrown into the smelting furnace and converted into copper bars. I quote from Mr. Cowles letter of March 7, 1907: "The story of the saving of these plates from a smelting furnace will probably interest you. Some time about the year 1873, there was found a number of the Audubon copper-plates among the scrap copper sent to the refinery of the Ansonia Brass & Copper Company, at Ansonia, Conn., to be converted into copper bars. I am of the opinion that the number included the complete set of plates engraved by Robert Havell for the 'Birds of America.'

"At that time I was about fourteen years old. I was beginning the study of taxidermy, and was naturally deeply interested in birds. I happened to be at the refinery watching the process of loading one of the furnaces, and noticed on one of the sheets of copper that a man was throwing into the furnace, what appeared to me to be a picture of a bird's foot. I took the plate from him, cleaned it with acid, and thereupon discovered the engraving, or as I termed it, the picture, of a bird (Plate CVI, Black Vulture). I made an immediate but unsuccessful request to the foreman of the furnace not to melt the plates; and then I appealed to the superintendent, but without avail. I next brought the matter to the general manager of the concern, my father, from whom I received no encouragement. This sort of treatment was evidently what I needed, for I hastened back to the works in a state of mind so determined that I succeeded in having all of the plates that had not been melted removed to a place of safety. This occurred in the spring of the year; and the plates remained undisturbed until the annual inventory was taken the first of the following year. At that time the question of the disposition of the plates was brought up. I appealed to my mother and interested her to such an extent that she drove to the factory and looked at one of the plates. She of course recognized that they were Audubon plates; and instructions were given by my father to keep them intact. The plates

were subsequently submitted to a treatment which removed all oxidation and then taken to the main office of the company, and, to the best of my recollection, distributed as follows: Mr. Wm. E. Dodge, president of the company, had a few plates sent to the American Museum of Natural History, New York City, and a few plates to the Smithsonian Institution, Washington, D. C., and I think he retained one or two for himself. The remainder of them, with the exception of two, my father kept; and they have since come into my possession by purchase from the estate. The two plates just excepted were Nos. 22 and 82 and they particularly struck my fancy, so much so that when the plates were first discovered I managed to secure them on the quiet, cleaned them myself and hid them; and when the plates were distributed no one knew of the existence of these two and they later became my property.

"I have sent two plates to Miss M. R. Audubon; and there are two others that I think I could locate. This will make nine plates that I know of, besides the plates in the museums previously mentioned and those that may be in the possession of the heirs of Mr. Wm. E. Dodge.

"Some of the plates in my possession are in very much better condition than the rest of them; and I have no doubt but what good imprints could be obtained if it was thought desirable to use them for that purpose."

A number of the plates were unquestionably sold from New York before they were shipped to Ansonia, as Mr. John H. Sage, Portland, Conn., informs me that two in his possession were presented to him in 1893 by Mr. Thomas R. Pickering, president of the Pickering Governor Company of Portland, who purchased them with others, some years before that date, for old metal in a junk shop in New York City. All of these plates were scratched and bent, but he put those presented to Mr. Sage and two others to the Wesleyan University, Middletown, Conn., in as good condition as possible. Such as were utterly ruined, were melted up in the works.

In the 'Forest and Stream' of September 12, 1896, is the following note on the copper-plates.

"Audubon's Plates sold for Junk.

Boston, Sept. 4, 1896.

"EDITOR FOREST AND STREAM:— I notice in your last issue you announce you propose to publish for the benefit of 'Forest and Stream' readers some of the Audubon pictures, and it reminds me that over twenty-five years ago our house had sent them from New York six of the original copper plates of Audubon's birds as sample of the lot, which were to be sold for old metal. They were in very good condition, and by a very little retouching could have been used again. We thought it a shame to destroy them and tried to get some of our Boston publishers to purchase them for legitimate use, but failed in so doing. James R. Osgood¹ almost was persuaded, but we finally sent them back to New York, as we would not consent to be instrumental in their final destruction. Whatever became of them eventually I never heard, or if I did have forgotten.

"I remember one of the sample plates we had was the bald eagle, and I managed to take a hand-rubbed copy from it. These plates were the Elephant Edition. I think our correspondents in New York at the time, of which there is one still living, might remember where they went to, for the senior took the same views of our house and thought it vandalism to destroy them: but as there were several tons in all, their value then for old metal, copper being so high in price, amounted to a good sum.

"RENIGNOLDS [E. R. SHATTUCK]."

As a matter of record of the present resting place of such of these plates as I have been able to locate, I append the following list. In addition to these thirty-seven plates, Mr. Cowles has record of two which he hopes to locate.

	<i>Plate.</i>	<i>Present location.</i>
Canada Goose.	CCLI.	American Museum of Natural History, New York.
Hutchins's Goose.	CCLXXVII.	"
Mallard.	CCXXI.	"
Wild Turkey, female and young.	VI.	"
Great Northern Diver or Loon.	CCCVI.	"
Snowy Owl.	CXXI.	"
Hawk Owl.	CCCLXXVIII.	"
Louisiana Hawk.	CCCXCII.	"
Sooty Albatross.	CCCCVII.	"

¹ James Ripley Osgood, publisher, born Feb. 22, 1836, died May 18, 1892.

	<i>Plate.</i>	<i>Present location.</i>
Rough-legged Falcon.	CCCCXXII.	Princeton University, Princeton, N. J.
Raven.	CI.	"
Red-shouldered Hawk.	LVI.	"
Three-toed Woodpecker (banded)	CCCCXVII.	"
Canadian "		
Phillips's "		
Maria's "		
Harris's "		
Audubon's "		
American Scoter Duck.	CCCCVIII.	Charles A. Cowles, Ansonia, Conn.
Herring Gull.	CCXCI.	"
Labrador Falcon.	CXCVI.	"
Black Vulture.	CVI.	"
Marsh Hawk.	CCCLVI.	"
Snow Goose.	CCCLXXXI.	Miss M. R. Audubon, Salem, N. Y.
Great White Heron.	CCLXXXI.	"
American Robin.	CXXXI.	Smithsonian Institution, Washington, D. C.
Chuck-wills-widow.	LII.	"
Virginia Partridge.	LXXVI.	"
Great Blue Heron.	CCXI.	"
Scarlet Ibis.	CCCXCVII.	"
Whooping Crane.	CCXXVI.	"
Trudeau's Tern. }	CCCCIX.	Wesleyan University, Middletown, Conn.
Havell's Tern. }		
Common Tern.	CCCIX.	"
Arctic Jager.	CCLXVII.	John H. Sage, Portland, Conn.
Ruby-throated Hummingbird.	XLVII.	"
Wild Turkey, male.	I.	Miss Grace H. Dodge, New York City.
Blue Bird.	CXIII.	"
Cowpen Bird.	CCXII.	"
Double-crested Cormorant.	CCLVII.	Rev. D. Stuart Dodge, Simsbury, Conn.
Pomarine Jager.	CCLIII.	Cleveland H. Dodge, New York City.
Night Heron.	CCXXXVI.	"
Brant Goose.	CCCXI.	Mrs. William Church Osborn, New York City.

I wish to express my sincere thanks to those who have rendered me assistance in securing information on this interesting subject.

II.

ROBERT HAVELL.

Robert Havell was born in Reading, Berkshire, England, November 25, 1793. He was in business with his father Daniel Havell until 1828 when the partnership was dissolved. It was at about this time when Audubon transferred the work of the engraving and coloring of his plates of the 'Birds of America' from W. H. Lizars, who had already issued the first ten, to Havell. His place of business was located at 77 Oxford St., London, opposite the Pantheon, and known as the Zoölogical Gallery, and it was here that the great work was carried on and completed. Besides the business of engraving and the publishing of works of art, an agency was formed for the sale of specimens and other objects connected with natural history. A general business was also done in water-color paints, brushes, crayons, albums, books, etc. In 1812, father and son published a series of 'Picturesque Views on the River Thames' engraved by them in aquatint from drawings by Robert's cousin, William H. Havell, who had a reputation as a painter in water-colors.

Here he remained until September, 1839, when he came to America with his wife and daughter. Under date of March 9, 1906, his daughter, Mrs. Amelia J. Lockwood¹ of New York, wrote me that they sailed in the ship 'Wellington' and upon their arrival traveled up the Hudson River to West Point and other towns, returning after a few weeks and visited at Mr. Audubon's, who had also returned to America and was residing in White St., New York. After residing in Brooklyn, N. Y., for two years, in 1841 Havell purchased a home in Sing Sing (now Ossining), a beautiful spot commanding a fine view of the Hudson River and Palisades, and named it 'Rocky Mount.' There he remained until 1857, when he purchased land and built another home at Tarrytown,

¹ Amelia Jane Lockwood, born 1826, died New York City April 6, 1907; widow of the late Brig. Gen. Munson Ingersoll Lockwood, Commander of 'The Lockwood Light Guard of Ossining.'

Robert Havell has a sister, Miss Marion Elington Havell, now living in New York City.

N. Y., remaining there until his death November 11, 1878, in his eighty-fifth year, and was buried in Sleepy Hollow Cemetery with his wife, who died July 10, 1878. Their first boy was named Audubon, and the naturalist stood god-father, holding the child while being baptised, in St. James church, London. This boy died two years later.

After coming to America, Havell devoted much time to painting in oils and a short time before his death gave an exhibition and sale at his home, of some seventy-five paintings representing landscapes, panorama views and ornithological subjects. The titles of some of these were 'Sun Set on the Hudson,' 'Life and Death of the Pines' (a forest scene in Canada; the old pines dead and the young pines springing up amid their graves), 'Indians gathering Wild Rice,' panorama views of 'East River' and 'Niagara,' 'Hawk attacking Mallard Ducks,' 'Death of the Warrior' (White-headed Eagle dying, and Canvasback Ducks trying to protect their young), 'Carolina Doves courting.' Not long since some of Havell's paintings were still in possession of his grandson, who also has the silver loving-cup which Audubon presented to his friend and engraver on the completion of the second volume. On this cup is engraved, "To Robert Havell, from his friend J. J. A. 1834."

Havell's skill and patience during the eleven years which the publishing of this magnificent work occupied, won for him the reputation he so justly deserved. Prof. John Wilson¹ (Christopher North) in his review of the work in Blackwood's 'Edinburgh Magazine,' Vol. XXX, 1831, says: "Mr. Havell is an engraver of great merit, and his skill has found noble employment in perpetuating the creations, for they are all full of imaginations, of the 'American Woodsman.' We have heard some of our best engravers speak in the highest terms of the execution of the plates that have appeared since the work came into the hands of Mr. Havell. Audubon first employed Mr. Lizars of Edinburgh; but that admirable artist himself recommended his friend to get the work executed in London that it might have the advantage of his own personal superintendence during the first years of its progress."

As it required over seventy-six thousand plates for the one hun-

¹ Prof. John Wilson, born Paisley, May 18, 1785; died Edinburgh, April 3, 1854. Frequent contributor to Blackwood's Magazine for many years from 1817.

dred and seventy-five copies¹ which are supposed to have been published, it is said that Havell was required to employ the services of over fifty persons. Notwithstanding the time and care which the engraver must have devoted to this mammoth undertaking, were it not for the constant and careful attention of Audubon in watching all details as the plates were executed, the work would not have the great reputation which it now bears.

Mr. Havell brought to America a copy of the 'Birds of America,' and it is said that every plate was carefully selected by himself. It remained in the family many years and was finally sold to Francis and Company, booksellers, New York. It was afterwards purchased by Dr. Gurdon W. Russell, Hartford, Conn., who presented it to the library of Trinity College July 10, 1900, after it had been in his possession for some twenty years.

I am much indebted to Mr. Robert Havell Lockwood, grandson of the engraver, for presenting me with the following hitherto unpublished letter, Audubon to Havell. It was written seven months prior to Havell closing up his business and sailing for America with his family.

Audubon to Havell.

Edinburgh, Feb. 20th, Monday, 1839.

My dear Mr. Havell

I perceive by the date of your letter of the 16th instant that you must have been some days beyond my expectations, in the receiving of my parcel to you, and that on that account my letter of Saturday last crossed yours of the same date. I thank you for what you say as regards the balance in my favor at Wright and Co.

Does Henry sail from *London Docks* or from *Portsmouth*? and pray what is the name of the Captain of the 'Wellington'? I do not precisely understand what you mean by the *loose sets* which you desire to know how they should be packed? let me hear what they are and how many of them by return of mail. The *five* perfect

¹ I have record of the present resting place of seventy-five copies owned in this country. With the exception of a very few sets, they are complete and in good condition. A set in the library of the Mechanics-Mercantile Institute, San Francisco, Cal., which had been there for some thirty years, and another set in the San Francisco Art Association, presented in 1894 by Mr. Edward F. Searles, Methuen, Mass., were both destroyed by the disastrous earthquake and fire which visited that city April 18, 1906.

sets I think might all go into one case, tinned as usual and insured of course to the full amount of their value, as well as all others and to which I pray you to attend as if for your own self. It is impossible for me to go to London at present, and indeed I cannot exactly tell when I will, and I trust to you entirely for the seeing that all the volumes are fair and good and passed through *your own* inspection of them before they are packed. No volumes of Biographies must be put in the same boxes.

When you have disposed of your business, what will you do with what you may have on hand belonging to us? This requires an answer from you at once. You have a great number of volumes of Biographies, Pictures &c. &c., a regular list of which you ought to send me. I cannot yet say when the 5th vol. of Biographies will be finished, but will let you know as soon as I can. I received yesterday morning a letter from a gentleman who has procured a copy of the work through Mr. Eame the bookseller, he says that he has called upon you to say that he has missing *one plate* and begs to have a copy of the plate struck and remitted to Mr. Eame who will pay you whatever price the extra trouble on this account may amount to, but he does not say what plate it is, and I therefor suppose that you do? If so as he is the brother-in-law of Mr. Walker of Ravensfield Park, one of our *good* subscribers I would say do it for him! My wife begs of you to save all the loose prints which were returned to you by our son Victor, as well as any others whatever, perhaps among them you might find one to send Mr. Eame's subscriber?

On the 4th of this month the 'Great Western'¹ was nearly half way across the Atlantic!! Sir William Jardine² has published a

¹ "At a meeting of the Directors of the Great Western Railway, Oct., 1835, one of the party spoke of the enormous length, as it then appeared, of the proposed railway from London to Bristol, Mr. Brunel exclaimed, 'why not make it longer, and have a steamboat to go from Bristol to New York, and call it the 'Great Western'?" The suggestion was evidently received with favor, for on July 19, 1837, the 'Great Western,' a steamship of 1340 tons and 236 feet in length, was launched and on April 8, 1838, she sailed on her maiden voyage, under command of Lieut. James Hosken, R. N., and reached New York on the 23rd inst. She was regarded as a nautical novelty and remained in commission for eighteen years.

² Sir William Jardine, born Edinburgh, Feb. 23, 1800; died Sandown, Isle of Wight, Nov. 21, 1874. Editor of two editions of Wilson's 'American Ornithology' 1832-34. Co-author, at the age of 25 years, with Prideaux John Selby, 'Illustrations of Ornithology,' 1830. Editor 'Naturalists Library,' 40 volumes, 1833-45, of which he wrote 14 volumes. He was keenly addicted to field sports and a master of the rod and the gun.

capital review of the work! What a strange world we do learn in! Be sure to let me know about the original drawings at Henry's, if he has finished them, where they are &c. &c. We all remain as usual with kind good wishes to you all,

Your friend

John J. Audubon.

6 Alva St.

[Superscribed]

Robert Hayell Esq.

Engraver.

77 Oxford St.

London.

III.

WILLIAM HOME LIZARS.

William Home Lizars, the engraver of the first ten plates of the 'Birds of America,' was born about 1787 and died at Edinburgh March 30, 1859. His father was an artist, publisher and engraver of some merit, and several of his paintings are still in the National Gallery of Scotland. After his father's death in 1812, William carried on the business of engraving and copper-plate printing to support his mother and family.

He learned the art of engraving from his father to whom he was at first apprenticed, and later studied engraving at the Trustees Academy at Edinburgh. He executed numerous plates of Scottish scenery for various publications, and in 1822 made many anatomical plates for his brother John, who had acquired a reputation in that branch of study, but William made his mark as an engraver by his 'Scotch Wedding' and 'Reading the Will,' which were exhibited at the Royal Academy in 1812. Later a co-partnership was formed with his brother Daniel under the firm name of D. and W. H. Lizars, the business being confined to the engraving and printing, as well as the selling of books. I am under many obligations to Mr. A. L. Wilkinson, Windsor, Ontario, for copies of three letters now in his possession, which were written by Audubon to his grandfather, Daniel Lizars, brother and partner of the engraver. On the 27th of October, 1827, Audubon had engaged him to act

as his agent in a certain territory. These letters refer to the selling of the parts as issued and the collecting of accounts from subscribers, and also dwell in a measure on the difficulty which Audubon was experiencing in receiving response to his communications. In the 'Journals' we see that Audubon at that time was intimate with the families and accepted the hospitality of both brothers, and Mr. Wilkinson writes me that he well remembers his mother telling him that Audubon staid at his grandfather's house for weeks at a time. Sir William Jardine, so prominent in ornithology, married in 1820 Jane Home Lizars, sister of the engraver, for his first wife.

Audubon to Lizars.

Daniel Lizars, Esq.,
Book Seller
5 St. David Street — Edinburgh.

Liverpool, 6th Dec., 1827.

My dear Sir:

I have been here two weeks today and would have wrote to you long since; but on my arrival at Manchester I received a large parcel of Letters from my wife, saying that she had relinquished the Crossing of the Atlantic for this winter that has so annoyed me and lowered my spirits that I really have had no wish to write to any one. I hope you are well and all the family. I received a letter from Mr. Havell saying that the Numbers and Prints to complete your sets had been forwarded you. I hope you have supplied the Glasgow Museum and the Revd. Mr. Craig. I will not ask if you have any new names for me as I *might* be disappointed were I to expect an affirmative answer. Please write to me here care of Messrs. Rathbone & Brothers and let me know what success you have had in collecting; and if any money of mine is in your hands please forward me. I will go from this to Derby and afterwards to Bristol and will acquaint you with my success. I have nine more names since I left you. If you see Sir Wm. Jardine tell him that Charles Bonaparte has left the U. S. for ever and is gone to reside at Florence in Italy. Pray tell your brother W. H. that I will write to him the moment I reach London and wish him and

his good wife Well and Happy. I have wrote to Mr. Havell to send you a No. 5 which I wish you to send to Professor Wilson or indeed a whole set, to enable him to write the notice he has promised me for the 1st of next month.

With sincere good wishes

I am yours ever and sincerely

John J. Audubon.

Daniel Lizars, Esq.,

Book Seller

5 St. David Street — Edinburgh.

London, January 21st, 1828.

My dear Sir:

My surprise at not hearing from you is extreme, I hope you are not unwell or that any misfortunes have befallen your family or your own concerns. When I write to any one I expect an answer but when I write to a man whom I esteem and to whom I entrust a portion of my business, I feel miserable until I hear from him. This is the third time since my leaving Edinburgh that I have addressed you and I now do beg that you will answer me by return of Post and attend to my injunctions detailed in my former letters. I am extremely desirous to close my business for 1827 and cannot do so without receiving your % and the money due by my subscribers. Pray answer me and believe me in great haste Yours

Truly and Sincerely,

John J. Audubon.

95 Great Russel Street

Bedford Square.

Daniel Lizars, Esq.,

Book Seller

5 St. David Street — Edinburgh.

London, January 22nd, 1828.

My dear Sir:

I have just time to say that a fortunate demand of my work makes me request of you to forward me as soon as possible after receiving this all the sets of 5 numbers which you have on hand keeping only one full set to show.— The days are now so short and

so dark here that the coloring cannot go on fast enough for me.— If I mistake not you can send me six full sets of 5 numbers — and should you not have received back the sets intended for Dr. Meckleham who is no longer on my list of subscribers — send for it and keep that one on hand. You may have them all put in one of the Boxes sent you by Havell. My list of subscribers for your District amounts now to Eighteen, six that you will send and one copy for you to show make Twenty-five. I am extremely anxious to hear from you. This will be the 4th letter that I have wrote to you without a word of yours — in great haste

Yours Sincerely

John J. Audubon.

95 Great Russell Street,
Bedford Square.

SOME BIRDS OF CENTRAL ALABAMA.

A LIST OF THE BIRDS OBSERVED FROM MARCH 7 TO JUNE 9, IN PORTIONS OF COOSA, CLAY AND TALLEDEGA COUNTIES, ALABAMA

BY ARETAS A. SAUNDERS.

SINCE our knowledge of the birds of Alabama is incomplete, and since few local lists have ever been published from this State, it was thought that the following would be worthy of publication, although the observations cover but a small area of country and a short period of time.

The area covered, consisting roughly of about 100 square miles, lies principally in the northwestern part of Coosa County, but includes also the southwestern corner of Clay County, at Hollins. Besides this, three days, April 14-16, were spent at Sylacauga, in the southern part of Talladega County. Our camp, about which the greater part of the observations were made, was situated one mile east of Woodbine, a small portable lumbering town which is moved about following the supply of timber, but was then situated in Coosa County, four miles to the west of Weogufka. Though

most of my observations were made at Woodbine, the period from April 16–May 4, which was in the height of the migration, was spent at Hollins, in Clay County. I also stopped in Hollins on March 7, when on my way to Woodbine.

The country here, occupying the extreme southern end of the Appalachian Mountains, is very rough and hilly. The elevation is principally from 500–600 feet, but there are one or two long ridges, such as Mt. Weogufka, just south of Woodbine, which have an elevation of from 1000 to 1100 feet. There are many small streams and creeks between the hills, the largest of these in the vicinity of Woodbine being Weogufka and Finigotchki Creeks. These creeks are from 40 to 80 feet wide and in most places 4 or 5 feet in depth. The principal forest growth is long-leaf pine (*Pinus palustris*) which occupies all the hilltops and higher and drier places. This tree, which generally grows on the flat, sandy areas of the coastal plain, at this point in its range extends farther inland and grows on rougher country than at any other place. The creek valleys and swales are occupied by a mixed growth of hardwoods, of such species as cow oak, tulip, red gum, etc. There are no true swamp areas, and no open meadows. A few farms are scattered here and there, forming small open areas in the otherwise unbroken forest. Many of these are at present deserted and slowly growing back to their original wild state. In the vicinity of Hollins most of the pine timber has been cut and there is a much larger per cent. of open country.

I found this tract of country quite a favorable one for the study of birds. Though the species found were comparatively few, individuals were in large numbers. Water birds and birds of open meadows were almost entirely absent. Species which were resident, either winter or summer, were present in large numbers, but transients were comparatively few. There seemed to be no marked paths of migration and no great flights of birds were observed.

There are three marked types of country in which birds are found; these are (1) pine forests, (2) hardwood forests, and (3) cleared land, second growth, etc. The pine forests are made up principally of a pure stand of long-leaf pine. This forms a very open forest which in most places, on account of the forest fires, is free of undergrowth, but in some places has a thick growth of black-jack and other oaks. The common breeding birds in this type of

country are as follows: Bobwhite, Mourning Dove, Great Horned Owl, Hairy Woodpecker, Downy Woodpecker, Red-cockaded Woodpecker, Pileated Woodpecker, Flicker, Nighthawk, Chipping Sparrow, Bachman's Sparrow, Indigo Bunting, Summer Tanager, Yellow-throated Warbler, Black-throated Green Warbler, Pine Warbler, Prairie Warbler, White-breasted Nuthatch, Brown-headed Nuthatch, Tufted Titmouse, and Carolina Chickadee.

The hardwoods form a much denser forest than the pine. The trees are in many places very tall and large. In open places there is a thick undergrowth of vines, cane and various shrubs. The breeding birds in this kind of country are as follows: Red-tailed Hawk, Broad-winged Hawk, Yellow-billed Cuckoo, Downy Woodpecker, Red-bellied Woodpecker, Chuck-wills-widow, Ruby-throated Hummingbird, Wood Pewee, Green-crested Flycatcher, Florida Blue Jay, Cardinal, Scarlet Tanager, Red-eyed Vireo, Yellow-throated Vireo, Black and White Warbler, Parula Warbler, Cerulean Warbler, Louisiana Water Thrush, Kentucky Warbler, Hooded Warbler, Carolina Wren, Tufted Titmouse, Carolina Chickadee, Blue-gray Gnatcatcher, and Wood Thrush.

The cleared land consists of small scattered farms, with a few buildings, areas of ploughed fields, and second growth in deserted fields. In moist places along the streams there are thickets of blackberry and cane. The second growth is largely young pine and red gum. The ploughed fields have many of them been cleared by girdling the timber and leaving it standing. These fields, full of old dead timber, form good nesting sites for many woodpeckers and other hole-nesting birds. The species breeding in this type of country are as follows: Bobwhite, Sparrow Hawk, Downy Woodpecker, Red-headed Woodpecker, Red-bellied Woodpecker, Flicker, Chimney Swift, Kingbird, Crested Flycatcher, Orchard Oriole, Goldfinch, English Sparrow, Field Sparrow, Cardinal, Blue Grosbeak, Indigo Bunting, Purple Martin, White-eyed Vireo, Blue-winged Warbler, Prairie Warbler, Maryland Yellowthroat, Yellow-breasted Chat, Mockingbird, Catbird, Brown Thrasher, Bewick's Wren, Brown-headed Nuthatch, and Bluebird.

On my arrival in Alabama on March 7, migration appeared to be already under way. Probably some winter residents had already left as only two Fox Sparrows were seen, and Phœbes, which I had

expected to find commonly, were not seen at all. The migration kept up steadily and evenly throughout March and April without any noticeably large flights, and lasted till about the middle of May when a few late transients were still present, although the breeding birds had settled down and been nesting for some time.

Since my stay in any one county did not last through the entire migration, complete lists for the counties were not possible. The following birds were found in Coosa County, but not in Clay County: Woodcock, Cooper's Hawk, Barred Owl, Belted Kingfisher, Whip-poor-will, Olive-sided Flycatcher, Bobolink, Red-winged Blackbird, Meadowlark, Purple Finch, Vesper Sparrow, Swamp Sparrow, Fox Sparrow, Cedar Waxwing, Loggerhead Shrike, Mountain Solitary Vireo, Bachman's Warbler, Orange-crowned Warbler, Tennessee Warbler, Kirtland's Warbler, American Pipit, House Wren, Winter Wren, Ruby-crowned Kinglet, Olive-backed Thrush, Hermit Thrush. The following birds were found in Clay County, but not in Coosa County: Wood Duck, Spotted Sandpiper, Screech Owl, Rose-breasted Grosbeak, Nashville Warbler, Yellow Warbler, Black-throated Blue Warbler, Chestnut-sided Warbler, Grinnell's Water Thrush, Wilson's Warbler, American Redstart, Short-billed Marsh Wren, Brown Creeper, Gray-cheeked Thrush. With the exception of the Warbling Vireo, which was found only in Talladega County, the remaining species were found in both Clay and Coosa Counties.

The following are some of the most interesting records in this list. The occurrence of the Florida Blue Jay in place of the more northern form appears to be a northern extension of the range of this bird. As the birds differed from the common Blue Jay not only in size and plumage but also in their notes I have no doubt that all, or practically all, of the Jays here were of this subspecies. The occurrence of the Nashville Warbler seems to be the first record of this species in the State of Alabama, as Prof. W. W. Cooke, in his report on the Migration and Distribution of Warblers, published in 1905, states that it had not been recorded from the State. The occurrence, in considerable numbers, of the Blue-winged and Black-throated Green Warblers as breeding birds, appears to be a southward extension of the breeding ranges, particularly of the latter species.

I am much indebted to Dr. Louis B. Bishop for the identification of subspecies, examination of the manuscript of this list, and for much encouragement and many helpful suggestions. I am also indebted to my classmates, who were with me in Alabama, and who helped and encouraged me in my work whenever possible.

In the following list those species of which specimens were taken are marked with an asterisk (*).

1. *Aix sponsa*. WOOD DUCK.—On April 18 a male bird was flushed from a small pool of rain-water at Hollins.

* 2. *Butorides virescens*. GREEN HERON.—First noted at Woodbine on April 5. Seen occasionally both there and at Hollins until May 6.

3. *Philohela minor*. AMERICAN WOODCOCK.—One seen on Weogufka Creek, Coosa Co., on May 28.

4. *Actitis macularia*. SPOTTED SANDPIPER.—One seen along a small creek at Hollins on April 18.

* 5. *Colinus virginianus*. BOBWHITE.—Very abundant at both Woodbine and Hollins. A nest containing 17 eggs was found on Mt. Weogufka on May 22.

6. *Meleagris gallopavo silvestris*. WILD TURKEY.—A pair of these birds were seen at Woodbine on April 11 and others were heard at Hollins April 21.

7. *Zenaidura macroura*. MOURNING DOVE.—Very abundant at Woodbine but less common at Hollins. Young birds, out of the nest, were seen as early as May 10.

8. *Cathartes aura*. TURKEY VULTURE.—Very common.

9. *Catharista urubu*. BLACK VULTURE.—Less common than the last species. Locally common in the steep, rocky country on the south side of Mt. Weogufka.

10. *Accipiter cooperi*. COOPER'S HAWK.—One female seen at Woodbine on March 15.

11. *Buteo borealis*. RED-TAILED HAWK.—Seen quite commonly and evidently breeding.

12. *Buteo platypterus*. BROAD-WINGED HAWK.—First noted on March 25 and soon became abundant. I was told of a nest of this species found on Finigotchk Creek in the latter part of May but did not see it myself.

13. *Falco sparverius*. SPARROW HAWK.—Quite abundant. Young birds, out of the nest, were seen on June 3.

14. *Syrnium varium*. BARRED OWL.—One seen on March 27.

15. *Megascops asio*. SCREECH OWL.—One heard at Hollins on April 27.

16. *Bubo virginianus*. GREAT HORNED OWL.—Quite common. A tree, cut down by the lumbermen on March 12, contained a large stick nest with one half-grown owl of this species. An attempt was made to keep this bird alive but it died in about a week.

*17. *Coccyzus americanus*. YELLOW-BILLED CUCKOO.—Quite common. First seen at Hollins on April 26.

18. *Ceryle alcyon*. BELTED KINGFISHER.—Seen but twice, March 15 and April 9 on Finigotchi Creek.

19. *Dryobates villosus audubonii*. SOUTHERN HAIRY WOODPECKER.—Seen occasionally but least common of the eight species of Woodpeckers found here.

20. *Dryobates pubescens*. SOUTHERN DOWNY WOODPECKER.—Very common.

21. *Dryobates borealis*. RED-CKOADED WOODPECKER.—Abundant in the pine woods. A brood of young, out of the nest, were seen on May 17.

22. *Sphyrapicus varius*. YELLOW-BELLIED SAPSUCKER.—Very abundant till March 24, last seen March 29.

23. *Ceophlæus pileatus*. PILEATED WOODPECKER.—Quite common at Woodbine, only one seen at Hollins.

*24. *Melanerpes erythrocephalus*. RED-HEADED WOODPECKER.—First seen on March 13. Not common till about April 1. The farmers, who call this species by the not inappropriate name of "Shirt-tail," shoot all woodpeckers, but particularly this and the next species, at every opportunity. They claim that these birds ruin their corn crop in the fall by ripping open the ripened ears.

*25. *Centurus carolinus*. RED-BELLIED WOODPECKER.—Abundant. A female bird was seen feeding young in a hole in a stump at Hollins, April 27.

26. *Colaptes auratus*. FLICKER.

27. *Colaptes auratus luteus*. NORTHERN FLICKER.—Flickers were abundant as winter residents but less common as summer residents, the change taking place about April 5. None were taken but it is thought that the wintering birds were of the northern form and the summer birds the southern.

28. *Antrostomus carolinensis*. CHUCK-WILLS-WIDOW.—First heard on April 9. Became common after this. A set of two eggs was found by Mr. J. A. Fitzwater on May 24.

29. *Antrostomus vociferus*. WHIP-POOR-WILL.—A bird seen at Woodbine, March 30. Others were heard in this vicinity April 4 to 7.

30. *Chordeiles virginianus*. NIGHTHAWK.—First seen April 21. Became very abundant.

31. *Chætura pelagica*. CHIMNEY SWIFT.—First seen on March 30. Very abundant.

32. *Trochilus colubris*. RUBY-THROATED HUMMINGBIRD.—First seen at Woodbine on March 29. Not seen again until April 21 at Hollins. Became abundant soon after this and a nest was found on May 9.

33. *Tyrannus tyrannus*. KINGBIRD.—First seen at Woodbine on April 9. More common at Hollins than at Woodbine.

34. *Myiarchus crinitus*. CRESTED FLYCATCHER.—Common. The first one was seen on March 30.

35. *Nuttallornis borealis*. OLIVE-SIDED FLYCATCHER.—A single individual was seen at Woodbine on May 9.

36. *Contopus virens*. WOOD PEWEE.— First seen on April 6. Became common after April 10.

*37. *Empidonax virens*. GREEN-CRESTED FLYCATCHER.— First seen on April 13. A very common bird and characteristic of the hardwood swales. A nest containing nearly full grown young was found in a branch of a water oak overhanging Weogufka Creek.

*38. *Cyanocitta cristata florincola*. FLORIDA BLUE JAY.— Dr. Bishop identified my specimens as this subspecies. Quite common. A pair were seen nest-building on March 29.

39. *Corvus brachyrhynchos*. AMERICAN CROW.— Not very common.

40. *Dolichonyx oryzivorus*. BOBOLINK. These birds were seen about Woodbine from May 4 to 10 but were not common.

41. *Agelaius phoeniceus*. RED-WINGED BLACKBIRD.— A flock of about forty individuals, composed entirely of females, was seen feeding on the opening red maple buds along Weogufka Creek on March 19.

42. *Sturnella magna argutula*. FLORIDA MEADOWLARK.— Seen commonly on cut-over and burned-over lands, where they looked entirely out of place, from March 17 to April 8. None were taken but the birds were assumed to belong to this subspecies.

43. *Icterus spurius*. ORCHARD ORIOLE.— First seen on April 12. Quite common at Hollins but less so at Woodbine. Confined to clearings and the vicinity of buildings.

44. *Icterus galbula*. BALTIMORE ORIOLE.— Rare. Seen at Hollins May 1 and 3, and at Woodbine May 10.

45. *Carpodacus purpureus*. PURPLE FINCH. Not common. Seen at Woodbine from March 15 to 29.

46. *Astragalinus tristis*. AMERICAN GOLDFINCH.— Very abundant.

*47. *Passer domesticus*. ENGLISH SPARROW.— Abundant wherever there are buildings.

48. *Poecetes gramineus*. VESPER SPARROW.— Seen at Woodbine on March 15 and 19, in flocks of Field and Chipping Sparrows.

49. *Zonotrichia albicollis*. WHITE-THROATED SPARROW.— Abundant till April 25. A straggler seen April 29.

50. *Spizella socialis*. CHIPPING SPARROW.— Abundant, both as a winter and summer resident. A characteristic bird of the pine woods, where it evidently nested in the pine trees.

51. *Spizella pusilla*. FIELD SPARROW.— Quite common as a winter resident. Less so as a summer resident. Nests containing eggs were found at Hollins on April 24 and 30. A nest containing half grown young was found at Woodbine on May 10.

52. *Junco hyemalis*. SLATE-COLORED JUNCO.— Common from the time of my arrival until March 30.

*53. *Peucaea aestivalis bachmanii*. BACHMAN'S SPARROW.— First seen on March 8 but was not common until March 15. On May 9 two nests were found, one containing eggs and the other newly hatched young. A young bird, out of the nest, was seen on May 19.

54. *Melospiza cinerea melodia*. SONG SPARROW.— Abundant from the time of my arrival until March 19.

55. *Melospiza georgiana*. SWAMP SPARROW.— Seen near Weogufka, Coosa Co., on April 14 and at Syllauga, Talladega Co., on April 16.

56. *Passerella iliaca*. FOX SPARROW.— A pair of these birds were seen on Weogufka Creek, March 11. I had expected to find this species an abundant winter resident, but believe that the main body had gone north before my arrival.

57. *Pipilo erythrophthalmus*. TOWHEE.— Abundant until the middle of April, and a few seen until May 1, at Hollins. I believe that a few bred here though I saw none later than this. One of our party, Mr. J. A. Fitzwater, saw one at Hollins on June 6.

58. *Cardinalis cardinalis*. CARDINAL.— Abundant. A nest containing two eggs was found at Woodbine on April 12. A third egg was laid the following day. A nest containing three newly hatched young was found at Hollins on April 28 and a young bird, out of the nest, on May 1. This last bird had caught its foot on a blackberry briar and was struggling to release itself. I released it and left it sitting on a stump, apparently none the worse for its escapade.

59. *Zamelodia ludoviciana*. ROSE-BREADED GROSBEAK.— Not common. Seen from April 25 to May 4.

*60. *Guiraca caerulea*. BLUE GROSBEAK.— First seen at Hollins April 24. More common at Hollins than at Woodbine but not abundant at either place. These birds seemed to prefer ploughed fields where patches of briars and bushes were left between the furrows.

*61. *Cyanospiza cyanea*. INDIGO BUNTING.— Common. First seen on April 14. Seemed partial to open pine woods where there was a thick, bushy undergrowth.

62. *Piranga erythromelas*. SCARLET TANAGER.— First seen on April 2. Quite common but not so abundant as the next species. Partial to hardwood bottoms.

*63. *Piranga rubra*. SUMMER TANAGER.— Very common. First seen on April 9. Partial to pine woods.

64. *Progne subis*. PURPLE MARTIN.— Quite common. Nearly every farmhouse has a colony of these birds nesting in hollow gourds swung from the top of a tall pole. The farmers told me that they kept the hawks away. I first noted this species on March 17.

65. *Hirundo erythrogaster*. BARN SWALLOW.— Common at Syllauga, Talladega, Co., April 14–16. Seen at Hollins on May 3, and at Woodbine May 9–10. On these last two dates the birds were all seen during the early morning, high in the air and flying northward. They were apparently migrating though it seemed rather late for migration of this species.

66. *Stelgidopteryx serripennis*. ROUGH-WINGED SWALLOW.— Seen at Hollins April 17 and 19, and on Weogufka Creek, Coosa Co., on May 11 and 29. They were probably breeding along the steep banks of Weogufka Creek.

67. *Ampelis cedrorum*. CEDAR WAXWING.—Not common. Small flocks were seen at Woodbine May 7-17.

*68. *Lanius ludovicianus*. LOGGERHEAD SHRIKE.—On May 4, while walking from Hollins to Woodbine, I saw several pairs of these birds in the vicinity of Stewartville, Coosa Co. One pair were feeding young in a nest situated in a clump of grape vines about 40 feet up. This is the only time I met this species.

69. *Vireo olivaceus*. RED-EYED VIREO.—Quite common. First seen March 31. A nest containing one fresh egg was found on Weogufka Creek on May 21.

70. *Vireo gilvus*. WARBLING VIREO.—One heard singing at Syllauga, Talladega Co., on April 16.

71. *Vireo flavifrons*. YELLOW-THROATED VIREO.—Not common. First seen March 27. Evidently breeding, as individuals were seen as late as June 3.

*72. *Vireo solitarius alticola*. MOUNTAIN SOLITARY VIREO.—First noted March 14. Common from March 21-April 12. An individual taken March 14, was referred to this subspecies by Dr. Bishop.

73. *Vireo noveboracensis*. WHITE-EYED VIREO.—Abundant. First seen March 17. A nest containing one fresh egg was found on Weogufka Creek on May 26. This may have been a second brood nest as I believed from the actions of the birds that they were breeding much earlier than this.

74. *Mniotilta varia*. BLACK-AND-WHITE WARBLER.—First seen March 14. Quite common and evidently breeding.

*75. *Helminthus vermivorus*. WORMEATING WARBLER.—Found at Hollins April 21 and 28, at Woodbine May 6.

*76. *Helminthophila bachmanii*. BACHMAN'S WARBLER.—A male bird was taken at Woodbine on the morning of March 20. Twice after that I thought I heard the song of this species but could not be certain of it.

77. *Helminthophila pinus*. BLUE-WINGED WARBLER.—Quite common. First seen on March 27. Although this warbler is not recorded as breeding in this vicinity, I found it abundant throughout the breeding season.

*78. *Helminthophila chrysoptera*. GOLDEN-WINGED WARBLER.—This bird was quite common for a transient and was observed from April 21 to May 7.

*79. *Helminthophila rubricapilla*. NASHVILLE WARBLER.—A female of this species was taken at Hollins on April 18. This appears to be the first record for this species in the State of Alabama.

80. *Helminthophila celata*. ORANGE-CROWNED WARBLER.—On March 27, at Woodbine, I saw closely a small warbler which I felt certain was this species, though I had had no previous acquaintance with it.

81. *Helminthophila peregrina*. TENNESSEE WARBLER.—One seen at Woodbine May 9.

82. *Compsothlypis americana*. PARULA WARBLER.—First noted March 20. Became common about March 26. Seen throughout my stay and evidently breeding.

83. *Dendroica æstiva*. YELLOW WARBLER.— Abundant at Sylacauga on April 18. Seen at Hollins April 25.

84. *Dendroica cærulescens*. BLACK-THROATED BLUE WARBLER.— Seen at Hollins April 19 and May 3.

85. *Dendroica coronata*. MYRTLE WARBLER.— Abundant from April 3 to May 2.

*86. *Dendroica cerulea*. CERULEAN WARBLER.— Locally common at Woodbine, in the tops of tall hardwoods on Finigotchki Creek, where it was first noted on April 10. It was evidently breeding here as it was seen as late as June 3. Seen but once at Hollins, April 21.

87. *Dendroica pensylvanica*. CHESTNUT-SIDED WARBLER.— Seen at Hollins April 25 to May 3. Not common.

88. *Dendroica striata*. BLACK-POLL WARBLER.— Not common. First seen at Hollins, April 28 and last at Woodbine, May 14.

89. *Dendroica blackburniæ*. BLACKBURNIAN WARBLER.— Not common. Noted at intervals from April 4 to May 10, both at Woodbine and Hollins.

*90. *Dendroica dominica*. YELLOW-THROATED WARBLER.— First noted on March 16. An abundant breeding bird, characteristic of the pine woods.

91. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.— First noted March 17 at Woodbine. Quite common in the higher hills, in the pine woods. I was much surprised to find that a number of these birds remained on Mt. Weogufka throughout the breeding season. They were evidently breeding and were last seen there June 9.

92. *Dendroica kirtlandi*. KIRTLAND'S WARBLER.— I met with an individual of this species at Woodbine, May 10, a Sunday afternoon when I unfortunately had no gun. I watched the bird closely for some ten or fifteen minutes. Its actions resembled those of the Pine Warbler but its song was rather like that of the Black-throated Green. It consisted of six notes. The first and fourth were long while the others were much shorter and in pairs. The first, and the last two, notes were pitched high, while the three middle notes were about a fifth lower.

93. *Dendroica vigorsii*. PINE WARBLER.— Very common, both as a winter and summer resident, breeding commonly in the pine woods.

*94. *Dendroica palmarum*. PALM WARBLER.— Fairly common from April 3 to April 27. It seemed to prefer ploughed fields along the edges of woods.

95. *Dendroica palmarum hypochrysea*. YELLOW PALM WARBLER.— A few individuals noted at Woodbine March 16 and 17. Another individual thought to be of this subspecies was seen at Hollins on April 17.

96. *Dendroica discolor*. PRAIRIE WARBLER.— First noted at Woodbine March 26. Abundant, inhabiting thick, bushy undergrowth in the open pine woods. A nest with four eggs was found at Woodbine, May 15.

*97. *Seiurus noveboracensis notabilis*. GRINNELL'S WATER THRUSH.— This species was noted at Sylacauga on April 16 and at Hollins April 22 to May 3. A bird taken at Hollins April 25 was identified as this subspecies by Dr. Bishop.

98. *Seiurus motacilla*. LOUISIANA WATER THRUSH.—First seen on March 9. Abundant. On every small creek one or more pairs of these birds were breeding.

*99. *Geothlypis formosa*. KENTUCKY WARBLER.—First seen on April 7. A common bird in the hardwood swales. A nest containing five eggs was found on May 19. A young bird, out of the nest but unable to fly, was seen on June 1. Another nest containing eggs, perhaps a second brood, was found on June 9.

*100. *Geothlypis trichas*. MARYLAND YELLOWTHROAT.—This species was first noted on March 16 and soon became common. A young bird, just out of the nest, was seen on May 20. A breeding bird, taken at Hollins on April 24, was identified as this form by Dr. Bishop.

101. *Icteria virens*. YELLOW-BREASTED CHAT.—First seen on April 11. Common at Hollins; less so at Woodbine.

*102. *Wilsonia mitrata*. HOODED WARBLER.—First seen April 4. Very abundant in the hardwood bottoms.

103. *Wilsonia pusilla*. WILSON'S WARBLER.—A male bird was seen at Hollins May 2.

104. *Wilsonia canadensis*. CANADIAN WARBLER.—Seen at Hollins May 2 and 3 and at Woodbine, May 9 and 14.

105. *Setophaga ruticilla*. AMERICAN REDSTART.—Seen at Hollins April 24–May 3.

106. *Anthus pensilvanicus*. AMERICAN PIPIT.—A single, lonely looking individual was seen on ploughed fields near Woodbine on March 12.

107. *Mimus polyglottos*. MOCKINGBIRD.—Common at Hollins but rather scarce at Woodbine.

108. *Galeoscoptes carolinensis*. CATBIRD.—Arrived April 12. More common at Hollins than at Woodbine.

109. *Toxostoma rufum*. BROWN THRASHER.—Seen throughout my stay but not common. I watched one feeding its young at Hollins April 27.

110. *Thryothorus ludovicianus*. CAROLINA WREN.—Very abundant. Broods of young were seen commonly on and after May 13. A second brood nest was found on May 19, containing two fresh eggs. Three more eggs were laid and the young were hatched and nearly full grown when we broke up camp on June 9.

*111. *Thryomanes bewickii*. BEWICK'S WREN.—First seen on March 21. Not common. On April 6 a pair were seen building a nest in a wood pile back of the turpentine still at Woodbine. At Hollins a few pairs nested among the piles of lumber in the mill yard, where I saw a brood of young on May 2.

112. *Troglodytes aëdon*. HOUSE WREN.—Seen at Woodbine April 1–12. Not common.

113. *Olbiorchilus hiemalis*. WINTER WREN.—Seen occasionally at Woodbine from March 8 to 26.

114. *Cistothorus stellaris*. SHORT-BILLED MARSH WREN.—On May

3 I was much surprised to find a male bird of this species, along a little alder-lined creek at Hollins.

115. *Certhia familiaris americana*. BROWN CREEPER.— One individual was seen at Hollins on March 7, the day of my arrival.

116. *Sitta carolinensis*. WHITE-BREASTED NUTHATCH.— Quite common. Both this and the next species were called "Sapsucker" by the natives.

*117. *Sitta pusilla*. BROWN-HEADED NUTHATCH.— Common. The first nest was found partly constructed on March 21. Nests were found commonly from then until about May 1, by which time most of the young had flown.

*118. *Bæolophus bicolor*. TUFTED TITMOUSE.— Very abundant. Birds were seen with nesting material on April 9 but no nests were found until May 8, when the young were nearly full grown. The young were very noisy and from then until May 15 a number of nests were easily found.

*119. *Parus carolinensis*. CAROLINA CHICKADEE.— Quite common

120. *Regulus satrapa*. GOLDEN-CROWNED KINGLET.— Abundant from my arrival until March 25.

121. *Regulus calendula*. RUBY-CROWNED KINGLET.— First seen March 9. Not common until March 15. Common from then to April 14. Stragglers seen up till April 25.

*122. *Poliophtila cærulea*. BLUE-GRAY GNATCATCHER.— First seen on March 15. Very abundant. From March 29, when the first birds began building, until May 15, when the last young flew, many nests were found, both at Woodbine and Hollins. Both young and old birds were noisy and attracted attention to their nests.

123. *Hylocichla mustelina*. WOOD THRUSH.— First seen on March 25. Abundant. A nest containing two fresh eggs was found at Hollins April 28. A young bird, out of the nest, was seen on Weogufka Creek, May 26.

124. *Hylocichla fuscescens*. WILSON'S THRUSH.— A pair were seen on March 16. Not seen again till March 24. Seen occasionally from then until April 18.

*125. *Hylocichla ustulata swainsonii*. OLIVE-BACKED THRUSH.— Birds belonging to either this or the next species were seen from April 11 to 25. One taken April 11, proved to be of this species.

*126. *Hylocichla aliciae*. GRAY-CHEEKED THRUSH.— See above species. A bird taken April 24 was of this species.

127. *Hylocichla guttata pallasii*. HERMIT THRUSH.— Seen from March 20 to April 13. To my surprise these thrushes sang commonly throughout their stay, during the early morning hours.

128. *Merula migratoria*. AMERICAN ROBIN.— Common from the time of my arrival until March 18.

129. *Sialia sialia*. BLUEBIRD.— Abundant. The first nest was found April 2, containing five eggs. Broods of young were seen commonly from April 30 to May 4. A second or third brood nest was found on June 5, with four fresh eggs.

BIRDS OF THE BELLINGHAM BAY REGION.

BY J. M. EDSON.

BELLINGHAM BAY is situated in the northwest corner of the United States, or to be more exact, in one of the northwest corners; for our country here has a sort of double corner. This results from the reëntrant course of the international boundary, which leaves the 49th parallel at the Gulf of Georgia and turns southerly to the Strait of Juan de Fuca, thence westerly to the Pacific. It is the more northerly of these corners that is here considered. The bay is sixteen miles in length with an extreme width of about eight miles, its greatest dimension being from north to south. The Nooksack River debouches into the bay at its northern extremity. About the river mouth there is a delta of marsh lands several square miles in area. These are populated throughout the year and particularly during migrations by numerous species of birds. The variety, changing with the season, includes waterfowl, wading birds, Chinese Pheasants, Marsh Hawks, Magpies, Red-wing Blackbirds, Kingfishers, Yellow-throats, Tule Wrens and other species.

On the eastern shore of the bay, about five miles from its northern end, is the city of Bellingham. From this point a fertile, forest-covered plain extends northward about sixty miles. A line drawn northeast from Bellingham would mark approximately its eastern limit. On the west this plain is bounded by Bellingham Bay and the Gulf of Georgia. It is traversed from east to west by both the Nooksack and Fraser Rivers, and the international boundary crosses it between these streams, at a distance of eighteen miles from Bellingham. Southward from this city the bay is bounded by a precipitous mountain wall for about seven miles, its southern end indenting the rich Skagit River bottom. Its western limit is marked by the islands of the San Juan Archipelago and the Lummi Peninsula.

The mountain wall referred to is the terminus of a spur of the Cascades, which here extends westward to tidewater. Some of the peaks of this spur rise to a height of 3000 feet. This is the only interruption in the wide belt of alluvial land skirting the salt water from the Snohomish River on the south, to and beyond the

Fraser on the north, a distance of about 125 miles. Nature has, however, kindly crossed this obstruction with three deep valleys which connect the low lands of the south with those of the north. In the more westerly of these valleys lies Lake Samish; in the next, Lake Whatcom; in the third valley is the South Fork of the Nooksack River, flowing northward and about thirteen miles distant from Bellingham.

East of this valley lies the main body of the Cascades in a confused tangle of rugged ranges trending to nearly every point of the compass. Many of these have an elevation of 6000 feet and more, and their crests are white with perpetual snow. Some of their peaks reach an altitude of 8000 and 9000 feet, and as a centerpiece for this particular section of the Cascades stands Mt. Baker, whose volcanic cone projects skyward nearly 11,000 feet. This mountain is thirty miles due east from Bellingham.

West of Bellingham Bay lie the San Juan Islands. A number of them are of considerable size, the larger ones having an area of two or three townships, while numerous others range downward to mere rocks. Some of these islands are rugged and mountainous, one reaching a height of 2400 feet. The group is interlaced by a network of tide-swept straits and channels, connecting the Gulf of Georgia with the Strait of Juan de Fuca. These passages vary in width from several miles to mere "holes in the wall." The waters abound in marine plants and the lower forms of animal life. This is the migration route of immense schools of salmon and lesser fishes. Whales, porpoises, sea lions and seals are common. As may be supposed, these are the haunts of resident waterfowl of many species in summer, and throngs of migrants at other seasons.

A dense, dark forest originally covered this entire region, and still largely preponderates over the clearings. The timber is chiefly fir and cedar, the trees reaching a height of 200 or 300 feet. There is also a sprinkling of spruce and other conifers, while hemlock and larch are found in the mountains. Alder is the most abundant deciduous species. It grows rapidly and when not restrained will quickly reforest clearings and slashings. Cottonwood and maple are sparsely distributed in the valleys and low lands. The undergrowth comprises vine-maple, willow, crab-apple, wild rose, devil's

club, syringa, spiræa, arrow-wood, elder, thimbleberry, salmon-berry, dewberry, red and black huckleberry, service-berry, salal, currant, gooseberry and Oregon grape. Post-oak and madrona are found on the islands. Ferns and mosses of several species grow in profusion.

Bird life is most abundant among the deciduous growth and open lands. Many species are increasing in abundance with the enlargement of the cleared area, as for instance the Western House Wren, Robin, Yellow Warbler, Chipping Sparrow and Meadowlark. The gloomy depths of the evergreen forest are but sparingly inhabited by birds. Among the mountains the most characteristic species is perhaps the Varied Thrush, while the Water Ousel occurs along the streams. The chatter of a Winter Wren, the tapping of a Woodpecker or the cries of the Oregon Jay are occasionally heard. Ruffed Grouse, Kinglets, Chickadees and Juncos appear now and then, while American Crossbills and Western Evening Grosbeaks are less frequent. The Raven, California Pygmy Owl and Golden Eagle are seen at times. As the timber line is approached the Sabbath-like stillness is often broken by the vigorous booming of the Sooty Grouse. The only birds found above timber line are Hummingbirds, which haunt the flowery region intervening between the timber and the snow, and occasional Horned Larks, Sandwich or Savanna Sparrows, Solitaires, Leucostictes and Ptarmigans.

An idea of the climatic conditions of the region may be gained from statistics of the United States weather bureau. Observations at Bellingham for a period of years show a mean annual precipitation of 31.5 inches; snow, 9 inches; average maximum temperature, 84 degrees; minimum, 12 degrees above zero; number of clear days, 133; partly clear, 126; cloudy, 105; days on which rain fell, 111; prevailing wind, southwest, south and southeast. Except on the mountains, snow seldom remains more than a few days or even hours, though severe weather is sometimes unaccompanied by snow. Back from the salt water the maximum temperature is several degrees higher. On the mountains conditions are of a more boreal character and the precipitation and particularly the snowfall is much heavier, with the temperature colder. The climate is humid, as the limited range of temperature would suggest, though there is a seeming contradiction in the remarkably light

rainfall, which is much less than at most other points in western Washington, and even less than in the eastern States. That of New York City, for example, is about 40 per cent. greater than the rainfall at Bellingham. This phenomenal deficiency of precipitation at this point is accounted for by the windward position of the Olympic Mountains.

My observations of the birds of this region have extended over a period of eighteen years, though not as systematic and thorough as might be desired. Bellingham and its immediate environs, including the adjacent water-front, have been my principal field of work. The Nooksack Marsh has often been visited, and the islands west of the bay a number of times. Excursions have occasionally been made to various points in the surrounding country. There have been a number of expeditions into the mountains, where the deep cañons and highest peaks alike were visited. Some of these trips have extended as far as fifty miles east of Bellingham. It will be noticed that this territory lies almost wholly within the Transition life zone, the higher mountains only coming within the Boreal.

The following list refers to 212 species and subspecies, besides 17 others which I have added hypothetically. Except in the case of those last mentioned, identification has been made from specimens in hand in nearly all cases. In the field it is usually difficult to distinguish between subspecies, hence the relative abundance of such is in many instances hard to determine.

1. *Æchmophorus occidentalis*. WESTERN GREBE.—An abundant winter resident, also occasionally seen in summer.

2. *Colymbus holboëlli*. HOLBØLL GREBE.—Common in winter and sometimes appearing in summer.

3. *Colymbus auritus*. HORNED GREBE.—Common in winter and occurs sparingly in summer.

4. *Podilymbus podiceps*. PIED-BILLED GREBE.—I have seen it a number of times in spring and autumn, also in July, I think.

5. *Gavia imber*. LOON.—Frequently seen throughout the year. Breeds about lakes.

6. *Gavia arctica*. BLACK-THROATED LOON.—On more than one occasion I have seen what I am quite confident was this species in spring plumage.

7. *Gavia pacifica*. PACIFIC LOON.—Frequent in winter, I believe, though its plumage is hard to distinguish from that of *arctica* or *lumme* at that season.

8. *Gavia lumme*. RED-THROATED LOON.—Quite common in winter.
9. *Lunda cirrhata*. TUFTED PUFFIN.—Fairly common as a breeding summer resident among the islands of the San Juan Archipelago.
10. *Cerorhincha monocerata*. RHINOCEROS AUKLET.—Mounted specimens in Bellingham were taken at Smith's Island, Strait of Fuca.
11. *Brachyramphus marmoratus*. MARBLED MURRELET.—Abundant in winter and fairly common in summer, though apparently it does not breed hereabout.
12. *Cephus columba*. PIGEON GUILLEMOT.—It breeds abundantly among the islands and is common throughout the year.
13. *Uria troile californica*. CALIFORNIA MURRE.—Frequently seen in winter.
14. *Stercorarius parasiticus*. PARASITIC JAEGER.—Occasionally seen during migrations.
15. *Rissa tridactyla pollicaris*. PACIFIC KITTIWAKE.—Occurs occasionally at Bellingham Bay.
16. *Larus glaucescens*. GLAUCOUS-WINGED GULL.—Abundant about the harbors in winter, retiring to the islands in summer, where it breeds in considerable numbers. It is the most characteristic gull of this region.
17. *Larus occidentalis*. WESTERN GULL.—Met with occasionally in winter.
18. *Larus argentatus*. HERRING GULL.—Frequently seen throughout the winter.
19. *Larus californicus*. CALIFORNIA GULL.—Occasionally met with at all seasons.
20. *Larus delawarensis*. RING-BILLED GULL.—Occasional in winter.
21. *Larus brachyrhynchus*. SHORT-BILLED GULL.—Abundant resident of the harbors in winter.
22. *Larus heermanni*. HEERMANN GULL.—Considerable flocks of non-breeding birds of this species spend the summer among the islands, and occasional birds are seen at all other seasons.
23. *Larus philadelphia*. BONAPARTE GULL.—Of frequent occurrence during migrations, often quite numerous in August.
24. *Sterna hirundo*. COMMON TERN.—One specimen in my possession was taken at the mouth of the Nooksack River, from a flock, Sept. 2, 1904. I have seen terns on three or four occasions.
25. *Hydrochelidon nigra surinamensis*. AMERICAN BLACK TERN.—One was taken by me Aug. 26, 1899, at the Nooksack Marsh.
26. *Diomedea albatrus*. SHORT-TAILED ALBATROSS.—One specimen in the Bellingham Normal School collection was taken at Cottonwood Island.
27. *Oceanodroma kaedingi*. KAEDING PETREL.—The same collection contains one specimen of this species, believed to have been taken on Bellingham Bay.
28. *Phalacrocorax dilophus cinctatus*. WHITE-CRESTED CORMORANT.—Occasional in winter.
29. *Phalacrocorax penicillatus*. BRANDT CORMORANT.—Common at

Bellingham Bay and among the neighboring islands throughout the year. Apparently it does not breed in this vicinity.

30. *Phalacrocorax pelagicus resplendens*. BAIRD CORMORANT.—A common summer resident among the islands, where there are numerous nesting colonies.

31. *Pelecanus erythrorhynchus*. AMERICAN WHITE PELICAN.—One specimen killed by an Indian at Sandy Point is in the Bellingham Normal School collection.

32. *Merganser americanus*. AMERICAN MERGANSER.—Occasional in winter.

33. *Merganser serrator*. RED-BREASTED MERGANSER.—Frequent in winter.

34. *Lophodytes cucullatus*. HOODED MERGANSER.—Frequently met with on lakes and streams at all seasons. Breeds.

35. *Anas boschas*. MALLARD.—Common as a resident, but more so during migrations. Breeds.

36. *Chaulelasmus streperus*. GADWALL.—I have seen but one specimen, which was taken in the Nooksack Marsh Nov. 7, 1902.

37. *Mareca americana*. BALDPATE.—Common except in summer.

38. *Nettion carolinensis*. GREEN-WINGED TEAL.—Abundant during the greater part of the year, a few remaining during summer, doubtless, breeding.

39. *Querquedula discors*. BLUE-WINGED TEAL.—Occurs occasionally in the Nooksack Marsh. August records suggest its possible breeding there.

40. *Spatula clypeata*. SHOVELER.—Occasional at all seasons. Probably breeds.

41. *Dafila acuta*. PINTAIL.—Common winter resident.

42. *Aix sponsa*. WOOD DUCK.—An occasional resident.

43. *Aythya americana*. REDHEAD.—Rare winter visitor.

44. *Aythya vallisneria*. CANVAS-BACK.—Moderately common about the southern end of Bellingham Bay in winter, and occasionally seen at other points.

45. *Aythya marila*. BLUE-BILL.—Common throughout the winter, particularly in the harbors.

46. *Clangula clangula americana*. AMERICAN GOLDEN-EYE. Quite common in winter on salt water.

47. *Clangula islandica*. BARROW GOLDEN-EYE.—A specimen in the Normal School collection was taken in this vicinity.

48. *Charitonetta albeola*. BUFFLE-HEAD.—Common throughout the winter. Numerous about the wharves of the city.

49. *Harelda hyemalis*. OLD-SQUAW.—Common on Bellingham Bay except in summer.

50. *Histrionicus histrionicus*. HARLEQUIN DUCK.—Non-breeding birds of this species are found among the islands in summer, sometimes in considerable flocks. They doubtless breed in small numbers along the larger streams. They are occasionally seen in winter.

51. *Oidemia americana*. AMERICAN SCOTER.—Occasional in winter. I have also seen flocks undoubtedly of this species among the islands in summer.

52. *Oidemia deglandi*. WHITE-WINGED SCOTER.—Resident throughout the year and common everywhere on salt water, particularly in winter. I have no evidence of its breeding.

53. *Oidemia perspicillata*. SURF SCOTER.—Resident throughout the year, being very abundant in winter. It apparently does not breed.

54. *Chen hyperborea*. LESSER SNOW GOOSE.—Occasional in winter.

55. *Anser albifrons gambeli*. WHITE-FRONTED GOOSE.—Occasionally reported by sportsmen in winter.

56. *Branta canadensis*. CANADA GOOSE.—Frequent migrant, seen occasionally throughout the winter.

57. *Branta canadensis hutchinsii*. HUTCHINS GOOSE.—Frequent in winter.

58. *Branta nigricans*. BLACK BRANT.—Common on salt water during winter.

59. *Olor columbianus*. WHISTLING SWAN.—Occasionally taken in winter.

60. *Botaurus lentiginosus*. AMERICAN BITTERN.—Frequent resident, breeding in Nooksack and other marshes.

61. *Ardea herodias*. GREAT BLUE HERON.—Common throughout the year about both fresh and salt water. To what extent if any *A. h. fannini* may be mingled with our herons is not yet determined.

62. *Grus canadensis*. LITTLE BROWN CRANE.—One specimen in my possession, taken nearby, is of this species.

63. *Grus mexicana*. SANDHILL CRANE.—Occasional migrants seen in flight are presumed to be chiefly of this species.

64. *Rallus virginianus*. VIRGINIA RAIL.—A resident occasionally seen in the marshes.

65. *Porzana carolina*. CAROLINA RAIL.—Rather rare. I have seen it in summer and autumn.

66. *Fulica americana*. AMERICAN COOT.—Common resident. Abundant in marshes in winter.

67. *Phalaropus lobatus*. NORTHERN PHALAROPE.—Occasional migrant.

68. *Gallinago delicata*. WILSON SNIPE.—Common except in summer.

69. *Tringa acuminata*. SHARP-TAILED SANDPIPER.—I secured four specimens of this rare species from a flock at the mouth of the Nooksack River Sept. 2, 1892.

70. *Actodromas maculata*. PECTORAL SANDPIPER.—Occurs occasionally during migrations, at times in considerable numbers.

71. *Actodromas minutilla*. LEAST SANDPIPER.—Common during migrations.

72. *Pelidna alpina sakhalina*. RED-BACKED SANDPIPER.—Frequently seen during migrations.

73. *Ereunetes occidentalis*. WESTERN SANDPIPER.—Common during migrations, often occurring in large flocks.

74. *Totanus melanoleucus*. GREATER YELLOW-LEGS.—Regularly seen in small numbers.

75. *Totanus flavipes*. LESSER YELLOW-LEGS.—An occasional migrant of irregular occurrence.

76. *Actitis macularia*. SPOTTED SANDPIPER.—Occurs sparingly as a regular summer resident.

77. *Numenius hudsonicus*. HUDSONIAN CURLEW.—Occasionally seen in spring.

78. *Squatarola squatarola*. BLACK-BELLIED PLOVER.—Occasional during migrations.

79. *Oxyechus vociferus*. KILLDEER.—Occasional. I have seen it only in fall and winter.

80. *Arenaria melanocephala*. BLACK TURNSTONE.—A specimen in my possession was taken from a flock of three at Bellingham Bay Feb. 8, 1894.

81. *Hæmatopus bachmani*. BLACK OYSTER-CATCHER.—A few pairs are found distributed among the islands in summer, where they breed.

82. *Colinus virginianus*. BOB-WHITE.—Common on the islands and at some points on the mainland. This, like the following two, is an introduced species.

83. *Oreortyx pictus*. MOUNTAIN PARTRIDGE.—Common on the islands; occasional on the mainland.

84. *Lophortyx californicus*. CALIFORNIA PARTRIDGE.—Common on the islands, particularly the low-lying ones.

85. *Dendragapus obscurus fuliginosus*. SOOTY GROUSE.—Common resident among the mountains, but rare in the lowlands.

86. *Bonasa umbellus togata*. CANADIAN RUFFED GROUSE.—Specimens are occasionally taken in the mountains which are undoubtedly of this subspecies.

87. *Bonasa umbellus sabini*. OREGON RUFFED GROUSE.—Common resident except among the higher mountains.

88. *Lagopus leucurus*. WHITE-TAILED PTARMIGAN.—Occasionally met with at snow-line in the mountains. In severe winters it has been taken among the foothills about Lake Whatcom.

89. *Phasianus torquatus*. RING-NECKED PHEASANT.—This elegant game bird found its way into Whatcom County from British Columbia about 1898, and within five years became common throughout the lowlands. It has also been introduced on some of the islands.

90. *Columba fasciata*. BAND-TAILED PIGEON.—A summer resident common in localities. It is doubtless diminishing in numbers.

91. *Zenaidura macroura*. MOURNING DOVE.—Rare summer resident.

92. *Cathartes aura*. TURKEY VULTURE.—Occasional resident.

93. *Circus hudsonicus*. MARSH HAWK.—Of frequent occurrence in the marshes.

94. **Accipiter velox.** SHARP-SHINNED HAWK.—Occasionally seen.
95. **Accipiter cooperii.** COOPER HAWK.—Rare.
96. **Accipiter atricapillus striatulus.** WESTERN GOSHAWK.—Occasional.
97. **Buteo borealis calurus.** WESTERN RED-TAILED HAWK.—Quite rare.
98. **Buteo swainsoni.** SWAINSON HAWK.—Rare summer visitor.
99. **Aquila chrysaëtos.** GOLDEN EAGLE.—Seen occasionally in the mountains.
100. **Haliaeetus leucocephalus.** BALD EAGLE.—Occurs frequently as a resident.
101. **Falco peregrinus anatum.** DUCK HAWK.—Rather rare resident. Breeds.
102. **Falco columbarius.** PIGEON HAWK.—I have taken it I believe.
103. **Falco columbarius suckleyi.** BLACK MERLIN.—A specimen in my possession is of this subspecies. It is very difficult to distinguish between this and the preceding species in the field, but one or the other, or both, together, are frequent residents.
104. **Falco sparverius phalœna.** DESERT SPARROW HAWK.—Common summer resident.
105. **Pandion haliaëtus carolinensis.** AMERICAN OSPREY.—Common summer resident.
106. **Asio accipitrinus.** SHORT-EARED OWL.—Occasional in winter in the marshes.
107. **Scotiaptex nebulosa.** GREAT GRAY OWL.—Rare. I know of but two instances of its being taken in the county.
108. **Cryptoglaux tengmalmi richardsoni.** RICHARDSON OWL.—One specimen in my possession was taken at Glacier, Whatcom County.
109. **Megascops asio kennicottii.** KENNICOTT SCREECH OWL.—Frequent resident.
110. **Bubo virginianus pallescens.** WESTERN HORNED OWL.—Frequent resident.
111. **Bubo virginianus saturatus.** DUSKY HORNED OWL.—Common. Coloration of the plumage of the Horned Owls shows considerable variation.
112. **Nyctea nyctea.** SNOWY OWL.—Occasional winter visitor, appearing some seasons in numbers, and at others not at all.
113. **Surnia ulula caparoch.** AMERICAN HAWK OWL.—Rare summer resident. I know of three specimens having been taken in the county.
114. **Speotyto cunicularia hypogæa.** BURROWING OWL.—Rare. One specimen has been taken at Bellingham.
115. **Glaucidium gnoma californicum.** CALIFORNIA PYGMY OWL.—Fairly common resident.
116. **Coccyzus americanus occidentalis.** CALIFORNIA CUCKOO.—Occasional summer resident.
117. **Ceryle alcyon.** BELTED KINGFISHER.—Common resident throughout the year.
118. **Dryobates villosus harrisi.** HARRIS WOODPECKER.—Frequently met with throughout the year.

119. *Dryobates pubescens gairdnerii*. GAIRDNER WOODPECKER.— Frequent throughout the year.
120. *Picoides arcticus*. ARCTIC THREE-TOED WOODPECKER.— A specimen in my possession was taken in this county March 8, 1905.
121. *Sphyrapicus varius nuchalis*. RED-NAPED SAPSUCKER.— I have taken one specimen in the mountains.
122. *Sphyrapicus ruber notkensis*. NORTHERN RED-BREASTED SAPSUCKER.— Frequent resident.
123. *Ceophloeus pileatus abieticola*. NORTHERN PILEATED WOODPECKER.— A resident, frequent throughout the year.
124. *Asyndesmus torquatus*. LEWIS WOODPECKER.— Summer resident, frequent in certain localities.
125. *Colaptes cafer saturator*. NORTHWESTERN FLICKER.— Common resident, less numerous in winter.
126. *Chordeiles virginianus henryi*. WESTERN NIGHTHAWK.— Common summer resident.
127. *Cypseloides niger borealis*. BLACK SWIFT.— Occasional summer resident, frequently appearing in numbers in early June.
128. *Chætura vauxi*. VAUX SWIFT.— Frequent summer resident.
129. *Selasphorus rufus*. RUFOUS HUMMINGBIRD.— Common summer resident. I have seen it as early as February.
130. *Selasphorus alleni*. ALLEN HUMMINGBIRD.— Frequent resident.
131. *Stellula calliope*. CALLIOPE HUMMINGBIRD.— Rare.
132. *Tyrannus tyrannus*. KINGBIRD.— Occasional summer resident.
133. *Tyrannus verticalis*. ARKANSAS KINGBIRD.— Occasional summer resident.
134. *Nuttallornis borealis*. OLIVE-SIDED FLYCATCHER.— Frequent summer resident.
135. *Contopus richardsonii*. WESTERN WOOD PEWEE.— Frequent summer resident.
136. *Empidonax difficilis*. WESTERN FLYCATCHER.— Common summer resident.
137. *Empidonax traillii*. TRAILL FLYCATCHER.— Common summer resident.
138. *Otocoris alpestris merrilli*. DUSKY HORNED LARK.— One specimen in my possession, which was taken in the mountains, is authoritatively assigned to this subspecies.
139. *Pica pica hudsonia*. AMERICAN MAGPIE.— Common in localities except in summer.
140. *Cyanocitta stelleri*. STELLER JAY.— A resident common throughout the year.
141. *Perisoreus obscurus*. OREGON JAY.— Common in the mountains and seen frequently in the lowlands in winter.
142. *Corvus corax principalis*. NORTHERN RAVEN.— Occasional resident among and near the mountains.
143. *Corvus brachyrhynchos*. AMERICAN CROW.— I have occasionally seen and have taken specimens believed to be of this species.

144. *Corvus caurinus*. NORTHWEST CROW.—A resident common throughout the year.

145. *Nucifraga columbiana*. CLARKE NUTCRACKER.—One specimen in my possession was taken in Bellingham Nov. 25, 1898.

146. *Molothrus ater*. COWBIRD.—I have seen one flock in mid-winter.

147. *Agelaius phoeniceus caurinus*. NORTHWESTERN RED-WING.—Of frequent occurrence in the marsh lands, flocking in winter.

148. *Sturnella magna neglecta*. WESTERN MEADOWLARK.—Common throughout the year.

149. *Euphaga cyanocephalus*. BREWER BLACKBIRD.—Frequent at all seasons, flocking in winter.

150. *Hesperiphona vespertina montana*. WESTERN EVENING GROSBILL.—Occasionally seen in the mountains in summer and in the lowlands in winter.

151. *Carpodacus purpureus californicus*. CALIFORNIA PURPLE FINCH.—Common; occasional in winter.

152. *Loxia curvirostra minor*. AMERICAN CROSSBILL.—Occasional resident.

153. *Leucosticte tephrocotis littoralis*. HEPBURN LEUCOSTICTE.—Occasional in the mountains. I have taken it at Bellingham in winter.

154. *Astragalinus tristis salicamans*. WILLOW GOLDFINCH.—I had seen but one pair of this species previous to the spring of 1908, when they appeared a number of times in one particular locality.

155. *Spinus pinus*. PINE SISKIN.—Frequently seen throughout the year, usually in considerable flocks.

156. *Passer domesticus*. ENGLISH SPARROW.—Common in Bellingham, where it made its first appearance in 1900.

157. *Passerina nivalis*. SNOWFLAKE.—Rare. I have seen but one specimen, which was taken Nov. 10, 1897.

158. *Passerculus sandwichensis alaudinus*. WESTERN SAVANNA SPARROW.—Common summer resident.

159. *Zonotrichia leucophrys nuttalli*. NUTTALL SPARROW.—Common summer resident.

160. *Zonotrichia coronata*. GOLDEN-CROWNED SPARROW.—Frequently observed as a migrant.

161. *Spizella socialis arizonæ*. WESTERN CHIPPING SPARROW.—Frequent summer resident.

162. *Junco hyemalis shufeldti*. SHUFELDT JUNCO.—A frequent summer resident and abundant throughout the remainder of the year. I cannot say that all our Juncos are of this subspecies, but I have not yet taken a satisfactory specimen of *J. h. oregonus*.

163. *Melospiza cinerea morphna*. RUSTY SONG SPARROW.—Common throughout the year.

164. *Melospiza cinerea rufina*. SOOTY SONG SPARROW.—Taken at all seasons. In the field this subspecies is with difficulty distinguished from the preceding, hence the relative abundance of the two is problematic.

One Song Sparrow specimen submitted by me to the U. S. Bureau of Biological Survey is identified as belonging to the proposed subspecies *M. c. phæa*, "Oregon Song Sparrow."

165. *Passerella iliaca fuliginosa*. SOOTY FOX SPARROW.— Occasional summer resident.

166. *Pipilo maculatus oregonus*. OREGON TOWHEE.— Resident; common throughout the year.

167. *Zamelodia melanocephala*. BLACK-HEADED GROSBEAK.— Occasional summer resident.

168. *Cyanospiza amoena*. LAZULI BUNTING.— Occasional summer resident.

169. *Piranga ludoviciana*. LOUISIANA Tanager.— Frequent summer resident.

170. *Progne subis hesperia*. WESTERN MARTIN.— Frequent summer resident.

171. *Petrochelidon lunifrons*. CLIFF SWALLOW.— I have seen one bird which clearly appeared to be of this species.

172. *Hirundo erythrogastra*. BARN SWALLOW.— Common summer resident.

173. *Iridoprocne bicolor*. WHITE-BELLIED SWALLOW.— Common summer resident.

174. *Tachycineta thalassina lepida*. NORTHERN VIOLET-GREEN SWALLOW.— Frequent summer resident. More common during migrations.

175. *Stelgidopteryx serripennis*. ROUGH-WINGED SWALLOW.— Frequent summer resident.

176. *Ampelis garrulus*. BOHEMIAN WAXWING.— A bird of this species was brought to me March 24, 1903. It was taken in this city, and may possibly have been an escaped cage bird.

177. *Ampelis cedrorum*. CEDAR WAXWING.— Common resident; not infrequent in winter.

178. *Lanius borealis*. NORTHERN SHRIKE.— Occasional in winter.

179. *Vireo gilvus swainsonii*. WESTERN WARBLING VIREO.— Common summer resident.

180. *Vireo solitarius cassinii*. CASSIN VIREO.— Rare summer resident.

181. *Vireo huttoni*. HUTTON VIREO.— Rare. I have taken a specimen as late as Nov. 16. Identification was made by the Bureau of Biological Survey.

182. *Helminthophila celata lutescens*. LUTESCENT WARBLER.— Our most abundant warbler; a summer resident.

183. *Dendroica æstiva*. YELLOW WARBLER.— Common summer resident.

184. *Dendroica coronata*. MYRTLE WARBLER.— I saw this species in the spring of 1908 on several occasions. Its resemblance to the female *D. auduboni* is perhaps the cause of its having formerly been overlooked.

185. *Dendroica auduboni*. AUDUBON WARBLER.— Frequent as a summer resident, and not infrequent in winter.

186. *Dendroica nigrescens*. BLACK-THROATED GRAY WARBLER.— Occasional summer resident.

187. *Dendroica townsendi*. TOWNSEND WARBLER.— Rare summer resident.

188. *Geothlypis tolmiei*. MACGILLIVRAY WARBLER.— Common summer resident.

189. *Geothlypis trichas arizela*. PACIFIC YELLOW-THROAT.— Frequent summer resident in the vicinity of marshes.

190. *Wilsonia pusilla pileolata*. PILEOLATED WARBLER.— Common summer resident — or at least, it and the following subspecies together are common.

191. *Wilsonia pusilla chryseola*. GOLDEN PILEOLATED WARBLER.— I am not as yet able to say how this subspecies compares in abundance with the preceding. Specimens submitted by me to the U. S. Bureau of Biological Survey are reported to have included both subspecies.

192. *Anthus pensilvanicus*. AMERICAN PIPIT.— Common during migrations, particularly in autumn, appearing in flocks.

193. *Cinclus mexicanus*. WATER OUZEL.— Frequent along mountain streams in summer and occasional in winter.

194. *Thryomanes bewickii calophonus*. NORTHWEST BEWICK WREN.— Resident throughout the year; common in summer.

195. *Troglodytes aëdon parkmanii*. PACIFIC HOUSE WREN.— Frequent summer resident.

196. *Olbiorchilus hiemalis pacificus*. WESTERN WINTER WREN.— Common in winter and frequent as a summer resident.

197. *Telmatodytes palustris paludicola*. TULE WREN.— Common summer resident of marsh lands; frequent in winter.

198. *Certhia familiaris occidentalis*. TAWNY CREEPER.— Occasional summer resident.

199. *Sitta canadensis*. RED-BREASTED NUTHATCH.— Occasional summer resident.

200. *Parus atricapillus occidentalis*. OREGON CHICKADEE.— Common throughout the year.

201. *Parus rufescens*. CHESTNUT-BACKED CHICKADEE.— Resident throughout the year. Occasional.

202. *Psaltiriparus minimus saturatus*. PUGET SOUND BUSH-TIT.— Rare summer resident.

203. *Regulus satrapa olivaceus*. WESTERN GOLDEN-CROWNED KINGLET.— Common throughout the year.

204. *Regulus calendula*. RUBY-CROWNED KINGLET.— Seen occasionally.

205. *Regulus calendula grinnelli*. SITKAN KINGLET.— Occasional in winter and during migrations.

206. *Myadestes townsendii*. TOWNSEND SOLITAIRE.— Occasional summer resident, more commonly at high altitudes.

207. *Hylocichla ustulata*. RUSSET-BACKED THRUSH.— Everywhere common in summer.

208. *Hylocichla guttata nana*. DWARF HERMIT THRUSH.—Rare. I have taken one specimen during spring migration pronounced by the Bureau of Biological Survey to be of this subspecies.

209. *Merula migratoria*. AMERICAN ROBIN.—Occasional. I cannot say just how it compares in abundance with the following subspecies.

210. *Merula migratoria propinqua*. WESTERN ROBIN.—Common in summer and frequent in winter.

211. *Ixoreus naevius*. VARIED THRUSH.—Common in the mountains in summer and frequent in the lowlands in winter.

212. *Sialia mexicana*. WESTERN BLUEBIRD.—Frequent summer resident and occasional in winter.

HYPOTHETICAL LIST.

1. *Synthliboramphus antiquus*. ANCIENT MURRELET.—Birds seen on several occasions were strongly suspected of belonging to this species.

2. *Stercorarius pomarinus*. POMARINE JAEGER.—One specimen taken has been noted as of this species, but identification was unsatisfactory.

3. *Phalacrocorax pelagicus robustus*. VIOLET-GREEN CORMORANT.—Believed to be not infrequent among our winter Cormorants.

4. *Larus vegæ*. VEGA GULL.—In January, 1905, a gull was observed by Mr. W. L. Dawson and myself at Bellingham, which was suspected of being *L. vegæ*.

5. *Aythya affinis*. LESSER SCAUP DUCK.—Birds probably of this species have been seen but thus far no satisfactory specimen has been secured.

6. *Aythya collaris*. RING-NECKED DUCK.—This species also is believed to have been seen, though none have been taken.

7. *Branta canadensis occidentalis*. WHITE-CHEEKED GOOSE.—Descriptions from sportsmen of geese taken by them would suggest that they were of this subspecies.

8. *Ardea herodias fannini*. NORTHWEST COAST HERON.—Specimens seen may perhaps be assigned to this subspecies.

9. *Charadrius dominicus*. GOLDEN PLOVER.—A sportsman who is familiar with the species avers that he once saw a flock and took specimens at a point near Bellingham.

10. *Ægialitis semipalmata*. SEMIPALMATED PLOVER.—A flock seen by me were thought to be of this species.

11. *Canachites franklinii*. FRANKLIN GROUSE.—Reported by a sportsman as having been taken at a point twenty miles northeast of Bellingham.

12. *Empidonax hammondi*. HAMMOND FLYCATCHER.—Birds have been seen which were thought to be of this species.

13. *Passerculus sandwichensis*. SANDWICH SPARROW.—Birds observed are supposed to have been of this species, though no satisfactory specimen has yet been secured.

14. *Junco hyemalis oregonus*. OREGON JUNCO.—Presumed to occur to some extent among the abundant winter Juncos, though unquestionable specimens have not been taken.

15. *Acanthis linaria*. REDPOLL.—A bird has been seen which was probably of this species.

16. *Passerella iliaca unalaschensis*. TOWNSEND SPARROW.—Specimens observed prior to the recognition of *P. i. fuliginosa* were recorded as of this subspecies, perhaps not always erroneously.

17. *Riparia riparia*. BANK SWALLOW.—I have several times seen birds thought to be of this species, but have failed to secure a specimen.

LIST OF THE BIRDS OF LOUISIANA. PART V.

BY G. E. BEYER, ANDREW ALLISON, AND H. H. KOPMAN.

(Continued from page 180.)

129. BOB-WHITE (*Colinus virginianus*). A common resident except in the swamp sections of the southeastern part of the State; but even in this low, fertile alluvial district, the Bob-white is fairly well established about the large sugar plantations, the thorough drainage of the land in such cases providing a suitable habitat for the species. In the uplands, this bird is most abundant in piney sections. In the southern part of the State mating begins about March 1, and nesting is well under way by the middle of April. Two broods are frequently reared, and birds just beginning to fly may often be seen as late as September 1.

The natural cover of Bob-whites in the piney sections is the edges of the runs or "branches" with which such country is interspersed. The birds usually seek such cover when flushed in the open pines. The thicket-like growths of small oak and hickory and of such shrubs and vines as witchhazel, smilax, and sumach that often occur in the higher portions of the pine woods also serve as excellent cover for Bob-whites, from a standpoint of both food and shelter. In the fertile alluvial section of the southeast, the sugar cane or corn and the edges of the swamp give this species its necessary cover. On model plantations, the ditch banks are kept clean, but in some cases Bob-whites may resort to them in safety.

130. PRAIRIE HEN (*Tympanuchus americanus*). This species, represented in western Louisiana by probably both the typical form, and by Attwater's Prairie Hen (*T. americanus attwateri*) is growing constantly scarcer in the State, and is known only near the Texas border.

131. WILD TURKEY (*Meleagris gallopavo silvestris*). The Wild Turkey is still common in some sections of the State. It appears to be entirely absent from the typical fertile alluvial section of the southeast. It is commonest in piney sections, and extends its range as far as the coast through the narrow strip of piney lands on the west of Pearl River.

132. PASSENGER PIGEON (*Ectopistes migratorius*). The last recorded occurrence of this species in Louisiana was during the extremely severe weather of February, 1895, when two were taken at Mandeville. One of these birds is in the museum of Tulane University.

133. MOURNING DOVE (*Zenaidura macroura*). Resident, but decidedly commoner in winter, an increase occurring at the latitude of the coast about October 1. This species is more generally distributed in the breeding season in the upland regions than near the coast, but in the latter section it nests freely about some of the plantations, especially in central southern Louisiana. It is most generally dispersed in the coast region in fall.

Nesting extends over a long period, the earliest record being April 17 (Ellisville, Mississippi, 1908), and young birds being found in the nest until late in September. The site is also variable: rarely the nest is placed on the ground, but pines and twiggy branches of deciduous trees are much more usual. One nest was observed in a dead plum bush, completely surrounded by the long moss-like *Usnea*. In southeastern Louisiana nests have been found in low willows over the water.

Singing begins a little after the middle of February, and continues until July; or even August, though this is not general.

134. WHITE-WINGED DOVE (*Melopelia leucoptera*). Birds unquestionably of this species have twice been killed on Grand Isle,—in May, 1894, and in August, 1895, and were reported and described by the captor, but the specimens were not saved for identification, owing to the heat (Beyer).

135. GROUND DOVE (*Columbigallina passerina terrestris*). A resident, but decidedly rare in most localities.

136. TURKEY VULTURE (*Cathartes aura*). An abundant resident, but not so common as the following species; slightly commoner in the northern part of the State than in the southern.

137. BLACK VULTURE (*Catharista urubu*). A very abundant resident, slightly commoner in the southern part of the State than in the northern. The proportion of this species to the preceding in southern Louisiana is probably about 3 to 1. Soaring flocks containing only this species are more frequently seen than flocks containing only Turkey Vultures, though the usual flock is composed of both species, with the Black Vultures preponderating. The Turkey Vulture flying singly is more often seen than the Black Vulture under similar circumstances.

Some notes follow, on the feeding habits of the two vultures. It may be stated first, that a common method of approach, in the case of *Catharista*, is a rapid and direct hurtling down, with the wings half-closed, producing a loud rushing sound. This brings the bird to within a hundred feet or less of the ground.

"I watched some Vultures at a dead horse to-day, and was much interested, although I could not, like Wilson, steal up until my feet were within a yard of the horse's legs, and sit down. The Black Vultures settle down in a much less dignified way than the Turkey Vultures: they begin, from

some distance up, to drop down at an angle of about sixty degrees, legs hanging, and wings flapping furiously. The other species circles about for some minutes, getting lower and lower, before it finally settles down, with less quick flapping than the Carrion Crow employs. The method of procedure with a carcass seems to be: To clean off the exterior trimmings first, then make a large hole under the tail — by which Wilson says they enter — and one in the side, from both of which they reach the entrails."

138. SWALLOW-TAILED KITE (*Elanoides forficatus*). A rather common summer resident in some sections, especially in the southern part of the State, where it often frequents the vicinity of bayous. It enters the State about April 1. (March 18, 1902, Bay St. Louis, Miss.). In the early fall, beginning about August 15, it collects in small flocks, often associating with the Mississippi Kite. At such times, it feeds largely on cicadas — or "locusts," as they are called in Louisiana; to secure this prey it remains in the neighborhood of cornfields on the plantations in the southern part of the State.

139. WHITE-TAILED KITE (*Elanus leucurus*). An accidental visitor. One was shot on the west bank of the Mississippi, opposite Kenner, on October 11, 1890 (Beyer).

140. MISSISSIPPI KITE (*Ictinia mississippiensis*). A rather common summer resident, preferring somewhat elevated country to the immediate coast section. In the early fall, however, it frequents the plantations of the southern part of the State in large flocks to prey on the cicadas in the cornfields. It arrives in spring during the first week of May.

141. MARSH HAWK (*Circus hudsonius*). A resident, but occurring in the southeastern section of the State chiefly if not entirely as a winter visitor. Breeding most commonly in the southwestern, or prairie section of the State. Winter visitors arrive in southeastern Louisiana the latter part of September, and remain until the latter part of March. It is common during this period in nearly all open localities.

142. SHARP-SHINNED HAWK (*Accipiter velox*). Chiefly a winter visitor, but has been observed in the southern part of the State occasionally in summer. Like most of the other hawks, this and the following species are present chiefly from October to March.

143. COOPER'S HAWK (*Accipiter cooperi*). Its movements are similar to those of the preceding species. Both of these breed more commonly in the upper districts.

144. HARRIS'S HAWK (*Parabuteo unicinctus harrisi*). Not observed by any of the writers, but has been reported as occurring along the coast and on some of the larger islands (Beyer).

145. RED-TAILED HAWK (*Buteo borealis*). A common winter visitor, occurring in about equal abundance in all sections, arriving at the coast about October 1, and departing the latter part of March.

146. KRIDER'S HAWK (*Buteo borealis kriderii*). A rather rare winter visitor.

147. HARLAN'S HAWK (*Buteo borealis harlani*). Rather common as

a winter visitor. None of the writers has evidence of its breeding in Louisiana.

148. RED-SHOULDERED HAWK (*Buteo lineatus*). A common winter visitor.

149. FLORIDA RED-SHOULDERED HAWK (*Buteo lineatus alleni*). A resident, and the commonest hawk in the State.

150. BROAD-WINGED HAWK (*Buteo platypterus*). Chiefly if not entirely a summer visitor, and confined as a breeder to the upland regions, especially pinewood sections. Usually makes its appearance in the southern part of the State about the end of March, and disappears in September.

151. AMERICAN ROUGH-LEGGED HAWK (*Archibuteo lagopus sanctijohannis*). A rather rare winter visitor.

152. GOLDEN EAGLE (*Aquila chrysaetos*). A specimen of this bird exhibited in the Mississippi Fish and Game display at the Louisiana Purchase Exposition in St. Louis, in 1904, was recorded by the taxidermist, Mrs. Carrie S. Vaughn, of Natchez, Miss., as having been killed at Jackson, La.

153. BALD EAGLE (*Haliaeetus leucocephalus*). Resident; breeds in various parts of the State, especially near the coast. Several nests were located for a number of years in tall dead cypresses in the swamps on the southern shore of Lake Pontchartrain near New Orleans.

154. DUCK HAWK (*Falco peregrinus anatum*). A common winter visitor in some sections, frequenting especially the marshes about the delta of the Mississippi, where it preys largely upon ducks and coots.

155. PIGEON HAWK (*Falco columbarius*). A fairly common winter visitor, appearing in the southern part of the State about the middle of September, and remaining until the latter part of March. It is commoner in open localities.

156. AMERICAN SPARROW HAWK (*Falco sparverius*). Resident, except in most of the southern part of the State. It reappears in considerable numbers at the latitude of the coast the latter part of August, and grows very common in September, disappearing from the coast section by the middle of March. It is about equally common in all sections of the State.

157. AUDUBON'S CARACARA (*Polyborus cheriway*). Restricted to the immediate coast section, west of the Mississippi River, being fairly common in some localities (Beyer).

158. AMERICAN OSPREY (*Pandion haliaetus carolinensis*). Occurs in nearly all sections of the State, but is most abundant in the southern part, breeding along the coast and about the shores of lakes and inlets.

159. AMERICAN BARN OWL (*Strix pratincta*). Rather generally distributed, but nowhere common. In the sugar districts of Louisiana, the ruins of the old-fashioned brick sugar houses frequently provide suitable haunts for this species.

160. AMERICAN LONG-EARED OWL (*Asio wilsonianus*). A rather rare winter visitor. A wing-quill of this species was found near Abbeville on June 18, 1904.

161. SHORT-EARED OWL (*Asio accipitrinus*). A rather common winter visitor, arriving in October, and remaining until March. It may be found in various open localities, including marshes, prairies, and plantations. An apparently authentic record exists of the breeding of this owl in Jones County, Mississippi, about 32° latitude. A discussion of the Screech Owl before a group of school children elicited from one of them the information that a nest containing "six little owls" had been found on the ground in her father's garden. It seems not possible that these could have been anything but this species.

162. BARRED OWL (*Syrnium nebulosum*). Occurs chiefly in the colder portions of the winter.

163. FLORIDA BARRED OWL (*Syrnium nebulosum alleni*). An abundant resident in all parts of the State.

164. SAW-WHET OWL (*Nyctala acadica*). There is only one record of the occurrence of this species in Louisiana known to any of the writers. This bird was killed in December, 1889, near Madisonville.

165. FLORIDA SCREECH OWL (*Megascops asio floridanus*). A common resident in all sections of the State.

166. GREAT HORNED OWL (*Bubo virginianus*). A resident, but not common in all parts of the State; occurs rather plentifully in the pine hills in the parishes north of Lake Pontchartrain. It is not very common in the fertile alluvial section of the southeastern part of the State.

167. SNOWY OWL (*Nyctea nyctea*). The late Mr. Gustav Kohn, of Paris and New Orleans, who spent a large part of his life forming a private collection of the fauna of Louisiana, recorded the occurrence of this owl at Baton Rouge a number of years ago. An owl said to have been of this species was killed at Bayou Des Allemands during the winter of 1878-1879 (Beyer).

168. BURROWING OWL (*Speotyto cunicularia hypogaea*). This bird is reported as being common about Jackson, and a male collected there November 24, 1898, is now in the museum of Tulane University. This owl has been observed also in Plaquemine Parish by Dr. H. L. Ballowe.

169. CAROLINA PAROQUET (*Conurus carolinensis*). There is a specimen of this bird in the Tulane museum that was undoubtedly collected in Louisiana, but when or where has not been determined. In localities where this species might still be expected to occur, the inhabitants did not know that a paroquet had ever occurred in Louisiana, and it is extremely doubtful whether this species should still be considered a Louisiana bird.

170. ANI (*Crotophaga ani*). The following notes, contributed by Dr. H. L. Ballowe, Coroner of Plaquemine Parish, and copied almost verbatim from his letter, represent almost the sum total of our knowledge of the Ani in Louisiana. It has been reported occasionally from St. Bernard Parish (Beyer), and once rather doubtfully from New Orleans.

"....One killed at Diamond in midsummer, 1893 [Now in Tulane University collection]. On January 29, 1906, I saw one in Buras. Got within a few feet of it. Heard its note. On January 14, 1908, I saw one

a few miles below Buras. On January 27, I saw another at Buras. February 8, I saw four together at Buras. All that I saw were on the public road, very gentle, hopping along the fences or among the low branches of orange trees.

"I saw young oranges that had been bitten into, the damage of which was blamed on them. Grackles are very destructive in orchards, but they *peck* the fruit. These oranges had *sections bitten out*. I understand that flocks of Anis are still seen in some orchards, but that twenty years ago they were *very* numerous and destructive."

171. GROOVE-BILLED ANI. (*Crotophaga sulcirostris*). Occasional in the southern parishes. One taken near New Orleans about 1890 is in the Tulane University collection.

172. YELLOW-BILLED CUCKOO (*Coccyzus americanus*). Few birds are more generally distributed in Louisiana than this species, and, though it is not unusually plentiful in any section, few are more uniformly common. Any deciduous tree growth attracts it, though it is commonest in moist situations. Yet it is by no means rare in scanty broad-leaved growths in the driest parts of pine hills and barrens. While the scrubby blackjack oaks of such situations often serve to conceal it, it is fondest, of course, of more leafy covers; but it resorts almost as readily to close groves in the open as to the forest. Probably it occurs in greatest abundance where cultivation borders the swamp or woodland in the lowlands. Low growths are most attractive to it when they occur in very wet localities, so that it often occurs in the marshes among the farthest outposts of the swamp.

The average date of the general arrival of this species in the latitude of New Orleans is April 15, though an irregular movement may occur the first week in April. The earliest recorded movement for the neighborhood of New Orleans is April 2 and the latest May 8. In advanced seasons it is decidedly common by April 20; in late seasons, no large numbers will be seen until May 1. It is seldom conspicuous except for a day or two at a time, after the middle of September, though the last has been observed at New Orleans on November 3, and a considerable passage of transients has been noted as late as October 13 (1894). Nesting begins very shortly after arrival, and laying usually begins about May 15. There are undoubtedly two broods raised in a season, fresh eggs having been discovered in July. A comparatively little choice seems to be exercised in regard to nesting sites, except that low nests are commonest in wet situations. The nidification in Louisiana does not differ essentially from that of the species elsewhere, though, of course, its materials there are peculiar in some cases. Near Jeanerette, St. Mary Parish, one of the writers found a strange cuckoo's nest on July 5, 1895. It was in a buttonbush (*Cephalanthus*) over the water; the foundation was lichen-covered oak twigs; the lining consisted of moss and dry cypress leaves. A very similar nest was found in Plaquemine Parish on June 9, 1904.

The habit of flying by night, and uttering its song as it flies, is very well marked. The migrations seem to be performed usually in silence; but after the first of May the nocturnal song is a common sound.

173. BLACK-BILLED CUCKOO (*Coccyzus erythrophthalmus*). This species is decidedly rare, though the difficulty of always distinguishing it from the preceding species doubtless causes it to be overlooked sometimes. A close lookout for it in southeastern Louisiana during the past ten or twelve years, however, has resulted in the observation of but one individual, which was seen at New Orleans, October 8-11, 1899. At Bay St. Louis, Miss., it has been observed of late years on the following dates: August 15, 1898; April 14, 1902; and October 15, 1902. It occurs only as a transient, of course.

174. BELTED KINGFISHER (*Ceryle alcyon*). Occurring chiefly along the coast, this species is nevertheless to be looked for at some season of the year on every water-course in the State. In winter it is almost confined to the coast and to the vicinity of the larger bodies of fresh water; but in the breeding season it is frequent also on the small creeks of the pine regions, and the stagnant sloughs of the swamps.

The character of the nest varies greatly with differing conditions of soil: On the coast it is content with such elevations as can be found on the shores, and the burrow is sometimes scarcely more than a pocket in the clayey banks; in the upper districts, the site is often far from water, and the soft, coarse-grained soil renders easy the excavation of a burrow five or six feet deep, enlarged at the end, and often partly lined with leaves and pine straw; and, finally, a unique condition exists in the extensive gum-swamps in the lake region of the southeast, where the land — always submerged — is perfectly flat, and nothing stands above water except innumerable trees and stumps of *Nyssa*: the nest is placed in the top of a decaying stump, with no attempt at excavation.

The kingfisher is charged with much harm to the levees along the Mississippi River, in which the nest-burrows are said to be very long and tortuous. It is possible that the softness of the soil is conducive to such extensive burrowing; but the matter has not yet been sufficiently investigated. At any rate, the great destructiveness to young crawfish that is acknowledged to be characteristic of the kingfishers in the fertile alluvial districts, would seem to offset the damage done to the levees; for the constant burrowing of these crustaceans, near the water-line, is a source of danger and annoyance to those dependent upon the levees for protection.

A well-marked migration takes place during the last week of March; the increase at that time is obvious everywhere, and it is then that the species first appears on the small streams of the interior. Two of the writers found, on March 25, 1907, what seemed to be a temporary resting-place constructed by a newly-arrived kingfisher, which was seen near it: this was a shallow pocket in the high bank of a creek in the interior, lined with green moss and pine straw. Whether or not such structures are usual, and whether this was intended to serve later as a nest, I cannot say: but deeper burrowing would have been easy, in the sandy soil of this bluff.

175. IVORY-BILLED WOODPECKER (*Campephilus principalis*). This

great woodpecker is probably confined to the deep swampy forests of northern Louisiana, where it is locally not uncommon. The following remarks, quoted here, for convenient reference, from 'The Auk,' Vol. XVII, 1900, pp. 97-99, are based upon observations made by Prof. Beyer in Franklin Parish in 1899, "in an almost inaccessible swamp, which extends from the most northern portion of Franklin Parish, between the Tensas River and Bayou Maçon, to Black River."

"The borders of Big Lake — in the midst of a heavy cypress swamp, — as well as the banks of some of the larger cross-bayous, are heavily timbered with ash, oak, and elm. In some of such localities are the homes of the Ivory-bill, and from them they do not appear to stray very far; in fact, I was assured that the range of a pair of these birds does not extend more than a mile from their nest.

"... We could hear quite frequently the rather plaintive but loud cry of the "Log-god" — for such the bird is called... in that section of the State... They are certainly noisy, and by their oft-repeated cry we became accustomed to locate them....

"But when Audubon states that they never build in dead or even dying trees, he was certainly mistaken; for I took one pair, with one of their progeny, from a nest situated in an old and nearly rotten white elm stump, a little over forty feet from the ground... We found and examined several nests; but we noticed only one — about twenty-five feet from the ground — in a *living* over-cup oak (*Quercus lyrata*).

"... I believe only one brood is raised; and the old birds continue to feed and care for their young long after they are able to take care of themselves. It was then near the middle of July, and old and young birds were still together; and the attention of the old ones was too entirely taken up by the young to leave any opportunity of preparing for a second brood."

176. SOUTHERN HAIRY WOODPECKER (*Dryobates villosus auduboni*). A fairly common resident in all forested regions. It shows no particular preference for one sort of timber over another, beyond shunning the most extended pine forests.

177. DOWNY WOODPECKER (*Dryobates pubescens*). A common resident, and well distributed, frequenting woodlands and orchards in practically all parts of the State. At the latitude of the coast, both the Downy and the Hairy Woodpecker begin nest-building in the first half of March. In most cases, two broods are raised, one in April, and one in June. In the Mississippi delta region, the Downy Woodpecker appears to prefer willow stubs as nesting sites. The Hairy Woodpecker nests indifferently in most of the common hardwoods.

178. RED-COCKADED WOODPECKER (*Dryobates borealis*). So far as we have been able to discover, this species is restricted to pine regions, and ordinarily it never enters the hardwood growths of such sections unless mixed with pine. It is resident wherever occurring. It is highly characteristic of the open long-leaf pine forests of the southern section of the State, and extremely common and noisy there. The time of breeding corresponds

rather closely with that of the Downy and Hairy Woodpeckers. It does not occur in southwestern Louisiana (Beyer).

179. YELLOW-BELLIED SAPSUCKER (*Sphyrapicus varius*). A regular and rather common winter visitor to all sections of the State, somewhat commoner in the upland regions. At the latitude of the coast, this species is present, from about October 15 to March 15. The first influx in the fall occurs, however, earlier in October, being about simultaneous with that of the migratory Red-shouldered Hawks and Barred Owls. The latest recorded date in spring is April 16 (Bay St. Louis, Miss., 1902).

180. PILEATED WOODPECKER (*Ceophlaeus pileatus*). Common but retiring in most well-wooded sections of the State; it is seldom found in the pinewoods, however, except in hardwood growths. Its favorite haunts are the heaviest swamps. It usually nests high; nests are sometimes not more than 25 feet from the ground.

181. RED-HEADED WOODPECKER (*Melanerpes erythrocephalus*). The distribution and time of occurrence of this species in Louisiana are decidedly complicated. Perhaps its most important status is that of a common summer visitor to the dryer regions of the State, especially the pine belts and the bluff lands; yet it is irregularly resident throughout the State, and may be found nesting or wintering, sometimes nesting *and* wintering, in localities in every section. Though least common in the Mississippi delta region, it has of late years become a resident in Audubon Park, New Orleans, and in other environs of the city. In those sections where it nests only, it does not usually appear until the latter part of April, and in those localities where it is a common summer visitor, its numbers increase at this season. While this species in Louisiana, as elsewhere, is fond of the neighborhood of cultivation, it is occasionally found in hardwood forests at considerable distances from human habitation. It is very fond of the open pine forests of the southern part of the State.

Nesting begins about May 1; two broods are raised,—the first, at the coast, during the height of the mulberry and blackberry season; the second brood is raised during July, in the fig season.

182. RED-BELLIED WOODPECKER (*Centurus carolinus*). The typical swamps of the lowland, and the mixed hardwood bottoms of the higher regions are the usual resorts of this species. It is met with in open situations rather frequently, and often nests about groves as well as in the woods. It is probably the commonest of the generally distributed woodpeckers in Louisiana. In time, its nesting corresponds with that of the other regular resident species. In some localities of the Mississippi delta region, this species occurs on the sugar plantations in much the rôle of the Red-headed Woodpecker as found elsewhere; it often leaves the woods and swamps to nest in telegraph poles and other exposed situations; the analogy is carried out by resemblances in notes and other habits.

183. FLICKER (*Colaptes auratus*). A common winter visitor, in all sections rather uncommon, especially in the southern section, as a resident. The bulk of the winter visitors are undoubtedly Northern Flickers (*C.*

auratus luteus). At the latitude of the coast the winter influx usually occurs October 10. The last winter visitors leave the coast the last of March. On the whole, flickers are commoner in upland and piney regions in Louisiana than in the lowlands. The Flicker is for the most part a woodland species in Louisiana. It is sometimes common in tree-dotted fields and pastures, however, and not infrequently breeds in such situations.

184. NORTHERN FLICKER (*Colaptes auratus luteus*). While, as suggested in the notes on the preceding, this subspecies is undoubtedly a common winter visitor, to Mr. A. H. Howell and Mr. P. A. Taverner is due the credit for the only definite records. I quote from Mr. Howell's notes (Proc. Biol. Soc. Wash., Vol. XXI, 1908, pp. 119-124): "Occurs in small numbers in all timbered regions [of northwestern Louisiana]: particularly common at Lecompte. . . . Taken also at Mansfield, April 27, 1907. . . . The only previous record of the Northern Flicker from Louisiana appears to be that given by P. A. Taverner of a tagged Iowa bird shot at Many, December 25, 1905 (Auk, XXIII, 1906, p. 232)."

185. GILDED FLICKER (*Colaptes chrysoides*). The Gustave Kohn collection, recently added to the Tulane University Museum, contains a male of this species, labelled Deer Range Plantation, Plaquemine Parish, December, 1863. It has some trace of red on the primary quills, and some sub-basal black spots on the red feathers of the mustache.

THE KING CAMEOS OF AUDUBON.

BY C. HART MERRIAM.

Plate VII.

THROUGH the courtesy of O. Atkins Farwell of Detroit and Frederic H. Kennard of Boston I am enabled to lay before the readers of 'The Auk' photographic reproductions of two cameos of John James Audubon. Both photographs are from casts of intaglios cut by John C. King, a Scotch artist and sculptor of Boston.

The cameo shown in the Farwell photograph was cut in 1844, and the photograph was presented by the sculptor to Mr. Farwell's father in 1871. Mr. Farwell, who kindly called my attention to the existence of the cameo and sent me the photograph, has also con-



From the Farwell photograph.



From the Kennard cast.

tributed the following information. He says: "My father and Mr. King were great friends, and on one occasion when father dropped into Mr. King's studio, he found Mr. Audubon sitting for the cameo. Mr. King introduced the two gentlemen and asked them to start a conversation, which was continued through the sitting. The two men became so animated in their very interesting conversation that they forgot where they were, and thus the artist was enabled to catch the natural and striking expression of the great ornithologist, which he could not have obtained under ordinary circumstances. My father was charmed with the man and his conversation, and always so expressed his memory of the occasion."

The cast shown in the second photograph is the property of Mr. Frederic H. Kennard of Boston and, like the first, was made from an original intaglio cut in shell by the sculptor King. I learned of its existence from Miss Maria R. Audubon, granddaughter of the great naturalist, and on writing Mr. Kennard for particulars received a prompt reply, of which the following is an extract: "Mr. King was a friend of my father's and also I believe of John J. Audubon, and cut this intaglio from life. He gave the cast, together with several others, to my father, who was under the impression that the intaglio was made some time between 1840 and 1845." This cast, through the courtesy of its owner, is shown in the accompanying illustration.

The sculptor King, Mr. Kennard tells me, died April 21, 1882, and was buried in Mount Auburn Cemetery, Cambridge, Mass., April 25, 1882.

Neither Mr. Farwell nor Mr. Kennard knows for whom the cameos were originally cut or by whom they are at present owned, and I am informed by Miss M. R. Audubon that the Audubon family has no information on the subject. Possibly some reader of 'The Auk' may be able to supply the missing facts.

Concerning the Kennard cast, Miss Audubon writes that her mother did not think it a correct likeness because of the nose, "which is too heavy and not arched as grandfather's was; but the pose, and the head and forehead are very fine."

In February last I sent Miss Audubon a copy of the Farwell photograph, which she had not previously seen. In acknowledging it she says: "The photograph came with your letter. I am de-

lighted with it and quite agree with you in thinking it a notable and attractive likeness. The photograph which I have from the cameo [cast] owned by Mr. Kennard is not at all the same. Both have the same pose, and the hair, collar, and neck are the same, but there the points of resemblance cease....I hope you will publish it in "The Auk."

The King cameos, which so far as I am aware have heretofore escaped public notice, are not only distinct additions to the known series of Audubon portraits, but to my mind form an important contribution to the material from which a true conception of Audubon's character may be gained. Most of the portraits are either poor, or show the naturalist as a young man, or in the decline of life; these reveal him at the noontide of his manhood and impress one with the strength and genius of his personality. The open frank expression, the clear eye, the firmly pressed lips, the strong nose and chin, the lofty forehead and the elevated pose of the head bespeak nobility of character, and make it easier to appreciate the vigor, determination, and courage that brought success in undertakings the very magnitude of which appals the ordinary man.

RECENT BIRD RECORDS FOR MANITOBA.

BY ERNEST THOMPSON SETON.

?LONG-TAILED SKUA. *Stercorarius longicaudus*. In September, 1896, Samuel Slater brought to Alexander Calder of Winnipeg, in whose collection it now is, an immature Long-tailed Skua, shot on Lake Winnipeg. Its dimensions are: Length, 16½ inches; wing, 12 in.; tail, 6½ in.; tarsus, 1¾ in.; middle toe and claw, 1⅝ in. All above sooty, except the neck, which is cream color, and crown, which is sharply blackish.

BLACK MALLARD OR DUSKY DUCK. *Anas obscura*. In my collection is a specimen from Shoal Lake taken by Geo. H. Meacham in 1901, and another taken near Winnipeg by W. R. Hine. According to Meacham two more were shot at Shoal Lake in 1899. C. C. Helliwell reports one taken on Lake Manitoba in the fall of 1898. It seems to be rare in this region yet it abounds on Athabaska River.

WOOD DUCK. *Aix sponsa*. Now shown to be a rare but regular summer visitant as far north as Lakes Winnipeg and Winnipegosis.

Over a dozen were taken on the Souris River, about 25 miles southwest of Brandon, between 1882 and 1899, by H. O. W. Boger. Three were killed at Brandon by C. C. Helliwell, who also saw two on the roof of the town station, one day about 1890. G. H. Meacham reports it rare at Shoal Lake, but one or two are seen there each year.

These with previous records completely spot the map of southwestern Manitoba. The species is doubtless found throughout the Alleghanian region of the Province.

ROSS GOOSE. *Chen rossii*. A specimen was taken on Red River near Winnipeg by Frank Marwood of that city, Sept. 20, 1902. It is now in the collection of Alexander Calder at Winnipeg.

BLUE GOOSE OR SILVER BRANT. *Chen carulescens*. Noted as a rare migrant. Specimens taken at Winnipeg and Brandon. At Fort Chipewyan, Lake Athabaska, where 10,000 or more geese were killed each autumn, only one of this species was taken in several years. This is now in my collection.

LEAST BITTERN. *Ardetta exilis*. On Nov. 9, 1907, E. W. Darby showed me a Least Bittern, a young male, that was taken about Oct. 20, at Oak Point, Lake Manitoba, by J. C. McNab.

According to W. R. Hine a specimen was shot in the Bishop's Marsh near St. Boniface in 1885 by Wm. Gordon (of Winnipeg). C. C. Helliwell has seen one or two about Oak Lake, Manitoba. Frank M. Chapman saw one at Shoal Lake June, 1901.

AMERICAN EGRET. *Ardea egretta*. In the summer of 1888, David Armit, an officer of the Hudson's Bay Company stationed at Manitoba House, while out shooting at Duck Bay, Lake Winnipegosis, came across and collected a fine adult specimen of this bird in breeding plumage. He has most generously sent the prize to me; it is now No. 1776 of my collection.

LITTLE GREEN HERON. *Ardea virescens*. W. Shaw Cottingham reports having seen a Green Heron at Brandon. C. C. Helliwell, another (not seen by me).

LITTLE BROWN CRANE. *Grus canadensis*. In Oct., 1892, I examined an adult specimen in the possession of Miss Ada Jewell of Toronto, Ont. It was taken in Qu'Appelle Valley, on the western boundary of Manitoba, about 1890. Its dimensions were wing, 19 in.; tarsus, 6 in.; toe, $3\frac{1}{4}$ in.; beak, $3\frac{3}{8}$ in.

Another is recorded (Man. Free Press, 5 March, 1904) from Portage la Prairie by Geo. E. Atkinson, May 6, 1898.

VIRGINIA RAIL. *Rallus virginianus*. The specimen in my collection was taken near Morden by D. Nicholson. I saw another in the collection of Geo. E. Atkinson of Portage la Prairie, and heard of another at Brandon. I have seen several taken near Winnipeg, Portage la Prairie; it is uncommon, but regular.

PASSENGER PIGEON. *Ectopistes migratorius*. The following are all the specimens I know of in Manitoba:—♂ adult taken at Winnipeg in 1892, now in collection of Father Blain, St. Boniface College.

♂ adult taken at Winnipeg in 1894 by E. Wilson, now in possession of J. K. Hardy of St. Boniface.

♂ adult taken at Winnipegosis on 13 April, 1898, by J. J. G. Rosser.

The last year in which the Pigeons came to Manitoba in force was 1878. Next year they were comparatively scarce, and each year they have become more so. In the early 80's a few were seen each season. The above 3 specimens were the last reliable recorded. None have been seen since. It is interesting to note that 1878 was also the last year of the vast Buffalo herds on the Saskatchewan.

In my own collection are three specimens of Passenger Pigeon: — yg. ♂, taken at Carberry, Man., by Miller Christy, 30 Aug., 1883. Adult ♂ and ♀, taken at Fort Holmes, Ind. T., by C. Dewar, Jan., 1889.

SWALLOW-TAILED KITE. *Elanoides forficatus*. Geo. Grieve tells me that two have been taken at Winnipeg, one in 1889 and one in 1892. Neither seen by me.

COOPER HAWK. *Accipiter cooperi*. On May 10, 1907, at Edmonton, Alberta, Ed. A. Preble and myself saw at short range in the woods, a Cooper Hawk. It could have been collected, had we had a gun. (This is of course far beyond Manitoba, but an interesting find that should be recorded.)

KRIDER HAWK. *Buteo borealis krideri*. Three specimens of this beautiful hawk have been taken at Winnipeg: one shot at Rosenfeld by Charles Stewart, Sept. 20, 1905; two now in the collection of A. Calder.

BROAD-WINGED HAWK. *Buteo platypterus*. In my collection are two specimens, one collected near Winnipeg May 3, 1905, by Ashley Hine.

It is reported from various parts of the Province where well timbered, and is generally distributed though not abundant. A. Calder has a beautiful melanistic specimen killed at Winnipeg, April, 1907.

RED ROUGHLEG; GOPHER HAWK. *Archibuteo ferrugineus*. One in the collection of E. W. Darby was shot in 1895 at Neverville, fifteen miles southwest of Winnipeg, by Geo. Grieve. There is another specimen in the Manitoba Museum.

?GRAY GYRFALCON. *Falco rusticolus*. A specimen was killed near Winnipeg in the fall of 1904 and mounted by E. W. Darby for the Manitoba Museum.

RICHARDSON MERLIN. *Falco richardsoni*. A fine specimen was killed in Winnipeg during the summer of 1900 and brought in the flesh to A. Calder in whose collection it now is. It is said to be a regular summer resident along the Souris River.

BARRED OWL. *Syrnium varium*. In my collection is a Barred Owl taken at Winnipeg, March 30, 1906, by Harry Jones. E. W. Darby writes me that he had four taken at Winnipeg in 1906, and one early in April, 1908.

At Portage la Prairie I was shown a female taken by G. E. Atkinson May 19, 1899.

J. S. Charleson writes me that on May 9, 1901, while canoeing up the

Assiniboine near Winnipeg he saw a Barred Owl in a tree. Also he secured a specimen from Riding Mountain in January, 1905; it was killed by T. S. Kittson, and had in its stomach a flying squirrel.

WHITE HORNED OWL. *Bubo virginianus arcticus*. In A. Calder's collection are two superb specimens of this northern race. They were taken recently at Winnipeg.

BURROWING OWL. *Speotyto cunicularia hypogaea*. In August, 1899, at the taxidermist shop of G. E. Atkinson, Portage la Prairie, Man., I saw two Burrowing Owls that were taken by a farmer about four miles northwest of the town, on June 2, 1897. Two others were brought to the shop in May, 1899.

The specimen in my collection (No. 2594) is one of two taken at Morden, Man., by D. Nicholson, the taxidermist. He reports it rare but regular and increasing. Two others were taken in 1902.

E. W. Darby tells me that it is becoming quite common along the Pipestone and on the slope of Riding Mountain.

In 1904 J. P. Turner found a nest eight miles northwest of Winnipeg. The species utilizes the burrows of the Richardson ground squirrel for a nesting place.

?LEWIS WOODPECKER. *Asyndesmus torquatus*. My friend Geo. F. Guernsey, V. S., of Fort Qu' Appelle, Sask., one hundred miles west of Manitoba, writes me Aug. 3, 1898: "I shot a Woodpecker last fall that I would like you to identify. Size about as large as the Downy Woodpecker, black tail, wings, back of neck and head with green lustre; belly, breast and throat, rose color; very shy, I never saw one before."

RED-SHAFTED FLICKER. *Colaptes cafer collaris*. A full plumaged female in my collection (No. 2546) was shot near Winnipeg Sept. 30, 1904, by T. Dolphin.

CRESTED FLYCATCHER. *Myiarchus crinitus*. Now shown to be quite common along the Assiniboine. On Aug. 29, 1904, I got one at Lake Winnipegosis. This is the northernmost that I know of.

ENGLISH SPARROW. *Passer domesticus*. This species is now found in all the settled portions of Manitoba and at every farmhouse and in all the towns of the northwest as far as Athabaska Landing, Alberta, about N. Latitude 55°, W. Longitude 113°. It first appeared at Carberry in 1892 but was not found in numbers until 1894.

GRAY-CROWNED FINCH. *Leucosticte tephrocotis*. A specimen has reached me from Birtle where it was taken in January, 1891, by Geo. Cope-land. It is there called 'Pink Snowbird.'

NELSON SPARROW. *Ammodramus caudacutus nelsoni*. In 1892 I found this sparrow abundant at Carberry and secured specimens, both breeding and migrant. In 1901 I found it common at Shoal Lake. In my collection are three specimens taken at Winnipeg. There can be little doubt that it is found throughout southwestern Manitoba and breeds wherever found.

INDIGO BUNTING. *Cyanospiza cyanea*. A specimen, a male adult

(No. 2531 Seton Coll.), was killed on June 3, 1893, by Wm. R. Hine near St. Boniface, between the Seine and Assiniboine Rivers, on the land between the Bishop's Marsh and the River Seine.

Another adult male was taken at Estevan, South Saskatchewan, by D. L. Thorpe 29 May, 1893. Estevan is eighty miles west of Manitoba.

In the collection of Father Blain, St. Boniface College, is an extraordinary specimen killed at Winnipeg. After careful examination E. A. Preble and I agree that it is probably a hybrid Indigo Bunting $\times$ Common Canary; may be escaped from captivity. With the general form and color of an Indigo Bunting female, it has some patches of yellow, and a white tail and wings.

DICKCISSEL OR BLACK-THROATED BUNTING. *Spiza americana*. August 10, 1899, I was shown an adult specimen of this bird, by G. E. Atkinson who shot it at Portage la Prairie, June 14, 1897. This was recorded in Man. Free Press, 5 March, 1904.

SCARLET TANAGER. *Piranga erythromelas*. I have seen two specimens that were taken at Winnipeg in 1892; one in the collection of Geo. Grieve, the other in the collection of W. R. Hine. He also took another and saw a third in 1888. It was about the end of May during a sudden cold spell; the third he saw on the bank of Red River in the city limits; he was within two yards of it for some time, but did not collect it.

SAW-WINGED SWALLOW. *Stelgidopteryx serripennis*. In the Manitoba Museum is a specimen of this swallow taken at Winnipeg by W. R. Hine.

ARCTIC BLUEBIRD. *Sialia arctica*. E. H. Patterson secured one of a pair that he found at a place two miles west of Brandon, Man., and sent the same to G. E. Atkinson, who recorded it in Man. Free Press, 5 March, 1904. To this Norman Criddle of Aweme, Man., adds (Ottawa Naturalist, July 1904, pp. 85, 86) that the species is by no means uncommon about the Carberry Sandhills, and that he has taken numerous nests there.



LAGOON IN THE COLORADO RIVER BOTTOMS NEAR NEEDLES, CALIFORNIA.



VEGETATION IN THE COLORADO RIVER BOTTOMS NEAR NEEDLES, CALIFORNIA.

BIRDS OF THE REGION ABOUT NEEDLES,
CALIFORNIA.

BY N. HOLLISTER.

Plate VIII.

IN THE spring of 1903, while engaged in field work for the United States Biological Survey, I spent some weeks in the vicinity of the Colorado River near the point where California, Nevada, and Arizona meet. The region is interesting from an ornithological point of view as little work has been done there since the days when Fort Mohave was a military post.¹

Arriving in the region from the west I spent from April 10 to 16 at Goffs (Blake postoffice), California, a station on the Santa Fé railroad between Bagdad and Needles and about twenty-five miles west of the Colorado River. The territory surrounding Goffs is extreme desert, a series of bare rocky hills and sandy flats with no trees whatever except a few scrubby tree yuccas about the bases of the hills. The flat districts are partly covered with a growth of the creosote bush (*Covillea tridentata*) and other desert shrubs, which are especially common and of greater size along the numerous dry washes; it was here that most of the birds were found.

On April 16 I moved east to Needles, a small town on the California bank of the Colorado River, where collecting was carried on until May 1. Two days were then spent on the opposite side in Mohave County, Arizona. On May 6, in company with a Mohave Indian, I went into camp in the low bottomlands of the California side ten miles above Needles. May 17 we moved camp to Twin Lakes, half a mile below the California-Nevada line, from which point excursions were made up the west bank of the river into southern Nevada to extend the known ranges of various species into that State. On the 25th I moved across the river to

¹ In the summer of 1902 Mr. F. Stephens collected in the Providence Mountains, about Needles, and at other points along the river, also in the interests of the Biological Survey, and published the results of his bird work, an interesting and valuable list, in 'The Condor,' Vol. V, Nos. 3 and 4, 1903.

Fort Mohave, Arizona, and worked there until May 29, when I returned to Needles.

The land bordering the Colorado River from the Santa Fé railroad bridge north to beyond the Nevada line is chiefly bottomland over which the river rises each spring. This bottomland varies from a narrow strip along the banks to wide areas several miles across. Just at and below the Nevada line are the wide bottoms of the California side, though in a great bend of the river below Needles are extensive flats. At the edge of the bottoms rise low mesas extending back from the river and soon developing into hills of considerable size which stretch back to the mountains bordering the valley. The mesa and hills are desert, covered for the most part with a sparse growth of creosote bushes and rabbit brush. The bottomland is thickly covered with arrow-weed (*Pluchea sericea*), willow, mesquite, and screw-bean with fine groves and forests of cottonwood. Here and there throughout the bottoms are ponds and lakes, some with a growth of tules about their shores.

On May 31 I left the river for Ivanpah Valley, some fifty miles northwest on the California-Nevada line, where I collected until June 6. Ivanpah Valley is a large basin, a flat desert tract nearly surrounded by hills and mountains. The elevation of the floor of the valley at Ivanpah station is about 3500 feet. At the northern end of the valley, some six or eight miles from the station, is a large dry lake bed, and the entire valley is typical desert with little water. From the dry washes in the center of the valley there is a gradual rise in each direction to the bases of the hills and mountains. Creosote bushes, grease-brush, and cactuses form the conspicuous vegetation of the valley proper and on the higher ground bordering the hills are a few tree yuccas. From June 6 to 12 was spent with a pack outfit on what is locally known as New York Mountain at the southern end of the valley. It is the highest point on the eastern end of the Providence Range, just well within the State of California, and was an agreeable change after the extreme heat of the arid desert of Ivanpah Valley. On the hills surrounding the mountain junipers appear and become abundant and larger higher up. About some small springs in the lower foothills are a few willows and over the whole mountain are patches of piñon (*Pinus*

monophylla) and a small species of live oak. In the gulches of the mountain side are several winter springs, still running sparingly at this date. The mountain is extremely rough and rocky and trails for pack animals are few. The formation is chiefly granite and immense boulders lie piled one upon another over most of the surface leaving little chance for the smaller plants. The highest ridge is said to be about 7000 feet in altitude, above which extend several barren rocky peaks some distance higher.

The bulk of the bird list refers to California territory; indeed, only two species — the Vireo and the Verdin — were not taken or seen on California soil, though both doubtless occur as plentifully on the west bank as on the east. Several species found to be common in California and southern Nevada in the immediate vicinity of the Colorado River have not previously been considered as regular summer residents in the vicinity, and I am not aware that the Dwarf Cowbird has been specifically reported from California or Nevada. Thanks are due to Dr. C. Hart Merriam, Chief of the Biological Survey, for permission to publish these notes.

Larus delawarensis. RING-BILLED GULL.—I examined the head, wings, and tail of a gull of this species which had been shot at Ivanpah station a few weeks previous to my visit. It was a single bird and when killed was circling over the water tank at the station.

Pelecanus erythrorhynchos. WHITE PELICAN.—Reported as sometimes common on the Colorado River at Needles during migrations. The Mohave Indians call the pelican Yak-win-ye-hool'-yah.

Mergus serrator. RED-BREASTED MERGANSER.—The sun-dried remains of a full plumaged male found on the desert near the center of Ivanpah Valley. The bird probably perished from want of water.

Anas platyrhynchos. MALLARD.—Said by the Mohave Indians to be common, with other ducks in the winter, on the Colorado River. Their name for the Mallard is Ah-nah-mō'.

Plegadis guarauna. WHITE-FACED GLOSSY IBIS.—A flock of eight seen flying low over the Colorado River at Needles, May 2.

Ardea herodias treganzai. TREGANZA BLUE HERON.—In the hotel at Goffs is a mounted Blue Heron which was killed some years ago on the dry desert near the station. On the Colorado River several were seen about the little lakes in the bottoms above Needles.

Nycticorax nycticorax nævius. BLACK-CROWNED NIGHT HERON.—At our camp above Needles in the Colorado River bottoms we frequently heard the Night Herons as they passed over in the evening.

Himantopus mexicanus. BLACK-NECKED STILT.—I shot a single bird

at a small pond in the Colorado River bottoms just below the Nevada line in California, May 9. My Mohave companion called it Min-sah-patch'-patch.

Actitis macularia. SPOTTED SANDPIPER.—Common about the little ponds in the river bottoms near Needles.

Oxyechus vociferus. KILLDEER.—Fairly common at Needles. The Mohave name for this bird is Nin-tee-ris-tah-rees'-a.

Lophortyx gambeli. GAMBEL QUAIL.—Abundant in the Colorado River bottoms where the calls of the cocks could be heard all through the day. An almost perfect egg was taken from a female shot April 22, and tiny young were seen the middle of May. The favorite retreat of this quail seems to be in the dense thickets of arrow-weed in the low land and comparatively few were found on the neighboring mesa. The Mohave Indians call it Ah'-ha-mah.

Zenaidura carolinensis. MOURNING DOVE.—Becoming more common each day of my stay at Goffs and later found in abundance in the river bottoms near Needles, where many nests were seen the first half of May. Also fairly common in Ivanpah Valley and on New York Mountain. Mohave name, Os-kee'-vah.

Cathartes aura septentrionalis. TURKEY BUZZARD.—One seen high over head at Goffs, April 16. Common along the Colorado River and seen daily in Ivanpah Valley. On New York Mountain the buzzards were common, gathering from the surrounding deserts in the evening to roost on the high rocky points. The Mohave Indian name is Ah-say'.

Accipiter cooperi. COOPER HAWK.—One female collected in the Colorado River bottoms above Needles, May 19. The Mohaves called the bird Sū-quil'-ä-ki-ti.

Buteo borealis calurus. WESTERN RED-TAIL.—Several seen along the Colorado River. Mohave name, Oo'-mah-thay.

 **Falco sparverius phalaena.** DESERT SPARROW HAWK.—A single bird seen along the telegraph line near Goffs, April 14.

Pandion haliaëtus carolinensis. OSPREY.—Frequently seen along the Colorado River. The Mohaves call the fish hawk Ah-spah-a-chee'-cū-thah.

Geococcyx californianus. ROAD-RUNNER.—Common in the timbered bottomland of the Colorado River and the brushy side draws, where several were caught in meat-baited traps set for carnivorous mammals. The stomachs of two examined were filled with large green grasshoppers. One seen in Ivanpah Valley near the base of New York Mountain. Mohave name, Tile'-paw.

Ceryle alcyon. BELTED KINGFISHER.—Several about the ponds in the Colorado River bottoms. Mohave name, Säk-wee-thay'.

Dryobates scalaris bairdi. TEXAS WOODPECKER.—Common in the river bottom about Needles where several specimens were collected. The Mohave name for woodpeckers in general is Iss-own'-ä.

Centurus uropygialis. GILA WOODPECKER.—I found this bird common in the timbered bottomlands of the Colorado River from Needles north

beyond the line some miles into Nevada. Specimens were secured in California ten miles north of Needles, where the loud calls and drummings were heard from morning until night. One nest was in a small blasted stub standing some distance from shore in a large lagoon.

Phalacroptilus nuttalli. POOR-WILL.—At Goffs one was heard calling on the evenings of April 15 and 16, and while camped on the Colorado River near the Nevada-California line we heard one each night on the higher mesa to the westward. Mohave name, Tō-lōwk'.

Chordeiles acutipennis texensis. TEXAS NIGHTHAWK.—Very abundant along the Colorado River. The nighthawks here spend the day in the thickets of arrow-weed from which I frequently flushed them. At night they swarmed about the town of Needles, especially at the station, where the insects were no doubt attracted by the lights. The switching engine seemed not to bother the birds in the least and I often saw them dart in and out of the thick black smoke close to a puffing freight. On the edge of the mesa at Fort Mohave one evening, just before the time for the night-hawk's flight, I saw and heard one give the peculiar chuckling call, which was accompanied by a most curious bobbing of the bird's head and body. Mohave Indian name, Oh-roo'.

Aëronautes melanoleucus. WHITE-THROATED SWIFT.—Several times when I climbed to near the highest rocky point on New York Mountain I saw four of these birds swiftly flying around the peaks.

Calypte costæ. COSTA HUMMINGBIRD.—Hummers were common in the neighborhood of the Colorado River and about the watered gulches on New York Mountain. The only specimen taken was shot high up on the mountain and proved to be of this species. The Mohaves call all the hummingbirds Yin'-yin-ä.

Tyrannus verticalis. ARKANSAS KINGBIRD.—Abundant along the Colorado River. A nest which I examined at Needles on May 18 was placed on the platform of a steel windmill tower in town and contained three eggs. Specimens collected. Mohave name, Sah-kahl-cheer'-kah.

Myiarchus cinerascens. ASH-THROATED FLYCATCHER.—Common at Needles and several seen on New York Mountain, at both of which places specimens were secured.

Sayornis saya. SAY PHOEBE.—A single bird seen at Goffs on April 16.

Empidonax griseus. GRAY FLYCATCHER.—One taken at Goffs, April 15. It was a single bird and was feeding among the higher creosote bushes along a dry wash.

Pyrocephalus rubineus mexicanus. VERMILLION FLYCATCHER.—Three specimens secured on the California side of the Colorado River ten miles above Needles where the bird was fairly common about the shores of lagoons. Several were seen also in Nevada a short distance above the boundary monument. Unlike most flycatchers this species rarely returned to the old perch after darting out to catch an insect, but usually flew on and on, lighting on a new bush after each dash. A nearly full grown young was taken May 20.

Otocoris alpestris pallida. SONORAN HORNED LARK.—Fairly common at Goffs. A few breeding in Ivanpah Valley where a family of nearly grown young was seen. Specimens collected at both places.

Aphelocoma woodhousei. WOODHOUSE JAY.—Four or five seen well up among the junipers and piñons on New York Mountain.

Molothrus ater obscurus. DWARF COWBIRD.—Abundant in the Colorado River bottoms during my entire stay. Specimens were taken on the California side above Needles, and all the evidence showed the bird to be a common summer resident. Seen above the boundary monument in Nevada. Mohave Indian name, I-thick'-wah.

Agelaius phoeniceus sonoriensis. SONORAN RED-WING.—A few male red-wings were seen flying high over our camp on the Colorado River above Needles and were probably breeding somewhere in the vicinity. Unfortunately no lighting place could be located and no specimens were taken so the subspecific determination is a matter of doubt. Possibly the form is *A. p. neutralis*. Mohave Indian name, Qual-e-täk'-a.

Icterus bullocki. BULLOCK ORIOLE.—A common breeding species in the river bottoms near Needles. Four specimens. Mohave name, Sück-ä-quah'-thah.

Euphagus cyanocephalus. BREWER BLACKBIRD.—During the early part of my stay at Needles a few were seen. Later all seemed to have left the region. Mohave name, Po-cah-bös'-oh.

Carpodacus mexicanus frontalis. HOUSE FINCH.—A few seen at Needles and on New York Mountain.

Astragalinus psaltria hesperophilus. GREEN-BACKED GOLDFINCH.—A few visited the small cottonwoods planted about the station at Goffs, April 14.

Poocetes gramineus confinis. WESTERN VESPER SPARROW.—Two taken and others noted on the desert at Goffs, April 12 and 13.

Zonotrichia leucophrys gambeli. INTERMEDIATE SPARROW.—Common in small scattering flocks at Goffs, April 9 to 16. Two specimens secured.

Spizella breweri. BREWER SPARROW.—Very abundant at Goffs. In full song and early in the morning the desert fairly rang with their music. None noted along the Colorado River but later in Ivanpah Valley a few were seen and one was collected June 2.

Spizella atrigularis. BLACK-CHINNED SPARROW.—Fairly common on New York Mountain. Full fledged young were taken June 7.

Junco hyemalis thurberi. THURBER JUNCO.—One taken and others seen along a dry wash far out on the barren desert at Goffs, April 13.

Amphispiza bilineata deserticola. DESERT SPARROW.—Fairly common at Goffs and in Ivanpah Valley.

Melospiza melodia fallax. DESERT SONG SPARROW.—Fairly common about some of the small bottomland ponds on the California side above Needles. On May 20 a specimen in juvenile plumage was secured and several families of young were seen.

Pipilo aberti. ABERT TOWHEE.—Abundant in the mesquite and arrow-

weed thickets of the Colorado River. Breeding on the California side about Needles where many full grown young were seen early in May. The Mohaves call this bird Cüm-tös'-kah.

Guiraca caerulea lazula. WESTERN BLUE GROSBEEK.—Common about openings along the river above Needles where four specimens were collected. Mohave name, Sück-ä-teeth'-a.

Piranga rubra cooperi. COOPER Tanager.—Common in the large cottonwoods from Needles northward along the California side of the river into Nevada. Four specimens collected ten miles above Needles. Mohave name, Min-sah'-öw.

Tachycineta thalassina lepida. NORTHERN VIOLET-GREEN SWALLOW.—A few seen about Needles during the early part of my stay.

Stelgidopteryx serripennis. ROUGH-WINGED SWALLOW.—Abundant along the river above Needles. Called by the Mohave Indians Höm-kây'.

Lanius ludovicianus excubitorides. WHITE-RUMPED SHRIKE.—One pair and a family of young recently from the nest were secured at Goffs, April 11. One seen on the mesa near Needles.

Vireo belli arizonæ. ARIZONA VIREO.—A single female taken at Fort Mohave, Arizona, May 25.

Dendroica auduboni. AUDUBON WARBLER.—Several seen at Goffs, April 10 to 15.

Geothlypis trichas occidentalis. WESTERN YELLOW-THROAT.—One seen in a bottomland thicket near Needles.

Icteria virens longicauda. LONG-TAILED CHAT.—Fairly common along the Colorado River where it was evidently breeding.

Oroscoptes montanus. SAGE THRASHER.—Common and in full song at Goffs, April 10 to 15.

Mimus polyglottos leucopterus. WESTERN MOCKINGBIRD.—Common at Goffs. One seen at Needles. In full song. Mohave name, Sö-köth-öl'-yah.

Toxostoma lecontei. LECONTE THRASHER.—Two seen among the larger creosote bushes in Ivanpah Valley. I found it exceedingly difficult to shoot one as they ran and flew low over the ground ahead of me at a greater speed than I could travel, and it was only by persistent stalking that a specimen was secured.

Salpinctes obsoletus. ROCK WREN.—Common on New York Mountain.

Catherpes mexicanus conspersus. CAÑON WREN.—Common high up on New York Mountain.

Bæolophus inornatus griseus. GRAY TITMOUSE.—Fairly common among the junipers on New York Mountain. Specimen collected.

Psaltirparus plumbeus. LEAD-COLORED BUSH-TIT.—Several bands of these tits were seen among the junipers on New York Mountain. Usually in parties of eight or ten and passed rapidly along, feeding by the way. Two specimens.

Auriparus flaviceps. VERDIN.—One seen in a thicket near Fort Mohave, May 26.

Regulus calendula. RUBY-CROWNED KINGLET.—A few noted in the higher bushes along washes on the desert at Goffs, April 10 to 15.

Polioptila cærulea obscura. WESTERN GNATCATCHER.—Fairly common on New York Mountain, where two were collected June 7.

Polioptila plumbea. PLUMBEOUS GNATCATCHER.—Several seen and one secured at Goffs, April 11. Fairly common among the mesquites and creosote bushes on the lower mesas back from the river above Needles.

THE BIRDS OF THE ROSEBUD INDIAN RESERVATION, SOUTH DAKOTA.

BY ALBERT B. REAGAN.¹

WHILE U. S. Indian teacher of the White Thunder Day School of the Rosebud Indian Reservation in 1904, I took notes on the occurrence and habits of the birds that chanced to visit the region. These I give below.

1. **Gavia imber.** LOON.—Migratory; rare.
2. **Larus delawarensis.** RING-BILLED GULL.—I saw but one individual of this species.
3. **Hydrochelidon nigra surinamensis.** BLACK TERN.—A male and female of this species were killed by an Indian of the camp who brought them to me for identification, remarking that they were sea birds.
4. **Pelecanus erythrorhynchos.** AMERICAN WHITE PELICAN.—An Indian of the camp killed a male pelican, skinned it and brought me the skin. I did not see the live bird.

The species of Anatidæ, given below, commenced appearing March 2 and commenced to go south August 21. None made residence in the region. But few crossed the area in the spring, they going further to the east. More passed in their southern journey. The journey south was much prolonged on account of the warm fall, the birds seeming in no hurry to leave.

Unluckily there was but little water in the vicinity of the author's location; consequently he had the opportunity of obtaining but a few specimens for identification.

5. **Anas boschas.** MALLARD.—Abundant in migration.
6. **Anas obscura.** BLACK DUCK.—I killed the only specimen I saw of this species.

¹ Supervising warden of the Olympic Bird Reserves, Washington.

7. *Nettion carolinensis*. GREEN-WINGED TEAL.
 8. *Querquedula discors*. BLUE-WINGED TEAL.—This species, together with *N. carolinensis*, constituted the majority of the ducks that passed over the region within the year.
 9. *Querquedula cyanoptera*. CINNAMON TEAL.—Rare in migration.
 10. *Spatula clypeata*. SHOVELLER.—A common migrant.
 11. *Dafila acuta*. PINTAIL.—A common migrant.
 12. *Bucephala albeola*. BUTTER-BALL.—Not common in migration.
 13. *Aythya vallisneria*. CANVAS-BACK.—Migratory; common.
 14. *Aythya affinis*. LESSER SCAUP DUCK.—Not common in migration.
 15. *Aythya collaris*. RING-NECKED DUCK.—I saw but one specimen of this species. This I flushed at the edge of the school dam.
 16. *Chen hyperborea*. LESSER SNOW GOOSE.—A common migrant.
 17. *Branta canadensis*. CANADA GOOSE.—Common.
 18. *Branta canadensis hutchinsii*. HUTCHINS'S GOOSE.—But one flock of these geese were seen.
 19. *Branta bernicla*. BRANT.—Rather common in migration.
 20. *Olor columbianus*. WHISTLING SWAN.—A flock of these swans was reported on White River.
 21. *Fulica americana*. AMERICAN COOT.—Very common.
 22. *Botaurus lentiginosus*. AMERICAN BITTERN.—I flushed this bird several times about the school pond, but I was unable to find a nest.
 23. *Ardetta exilis*. LEAST BITTERN.—Not common.
 24. *Grus americana*. WHOOPING CRANE.—Migratory; rare.
 25. *Grus canadensis*. LITTLE BROWN CRANE.—Common in migration.
 26. *Grus mexicana*. SANDHILL CRANE.—Migratory; common.
- These cranes, like the ducks, commenced crossing the region in the early days of March and commenced their southern trip across the same in the closing days of August; but unlike the ducks, about as many crossed the region in the spring as in the fall. But few of these birds alighted. Those that did seemed to prefer the high points to the water courses and low ground, the high points being the uninhabited areas.
27. *Rallus elegans*. KING RAIL.—I flushed this bird several times, but looked arduously for its nest without success.
 28. *Rallus virginianus*. VIRGINIA RAIL.—This bird is a common migrant, but evidence that it is a summer resident is wanting.
 29. *Porzana carolina*. SORA.—A rare summer resident.
- All of the species of Scolopacidæ, given below, are common migrants or rare residents of the region. The Bartramian Sandpiper nests in the upland region.
30. *Tringa maculata*. PECTORAL SANDPIPER.
 31. *Totanus melanoleucus*. YELLOW-LEGS.
 32. *Totanus flavipes*. LESSER YELLOW-LEGS.
 33. *Helodromas solitarius*. SOLITARY SANDPIPER.
 34. *Bartramia longicauda*. BARTRAMIAN SANDPIPER.
 35. *Actitis macularis*. SPOTTED SANDPIPER.

36. *Numenius longirostris*. LONG-BILLED CURLEW.
 37. *Numenius borealis*. ESKIMO CURLEW.—The last two species were well represented on the Butte Creek flats in June.
 38. *Ægialitis vocifera*. KILLDEER.—A common summer resident.
 39. *Colinus virginianus*. BOB-WHITE.—This bird is a rare resident of the reservation. I flushed but two on the reserve within the year. They, however, are an abundant resident over the line in the farming districts of Nebraska.
 40. *Bonasa umbellus*. RUFFED GROUSE.—A rare resident.
 41. *Tympanuchus americanus*. PRAIRIE HEN.—This bird is a very common resident of the uplands, but is a rare resident in the valleys. It prefers to keep shy of the settlements.
 42. *Pediceetes phasianellus campestris*. PRAIRIE SHARP-TAILED GROUSE.—A very common resident.
 42. *Zenaidura macroura*. MOURNING DOVE.—The doves are common throughout the reservation, but most numerous in the White River valley region. Here droves of doves fly about all day long in the fall.
 43. *Accipiter cooperi*. COOPER'S HAWK.—Resident; common.
 44. *Buteo borealis*. RED-TAILED HAWK.—Resident; common.
 45. *Buteo lineatus*. RED-SHOULDERED HAWK.—Resident; common.
- In the fall the hawks of each of the three species mentioned above collect in flocks and fly about the country in that manner for a considerable time before migrating. There are none, or few hawks of any kind, in the region in the winter season.
46. *Aquila chrysaëtos*. GOLDEN EAGLE.—This bird is common throughout the year, but more common in winter. It is from the feathers of this eagle and those of the Bald Eagle, next below, that the Sioux make their war-bonnets and other feathered regalia and paraphernalia. It takes a good horse to buy the feathers of one eagle.
 47. *Haliaeetus leucocephalus*. BALD EAGLE.—Common. This bird, with the Golden Eagle, feeds principally on prairie-dogs, hence they are a benefit to the region.
 48. *Falco rusticolus*. GRAY GYRFALCON.—But one individual of this species was seen by the author within the year.
 49. *Falco mexicanus*. PRAIRIE FALCON.—Rare.
 50. *Falco columbarius*. PIGEON HAWK.—Not common.
 51. *Falco sparverius*. AMERICAN SPARROW HAWK.—Resident; abundant.
 52. *Syrnium varium*. BARRED OWL.—Common.
 53. *Megascops asio*. SCREECH OWL.—This owl could be heard every night throughout the summer season. Its favorite haunts seemed to be the timbered region along the creeks. When putting in the school fence the children ran on to two of these birds and immediately advised me of their presence. Our work was done for that day. Not a child would proceed with the work. I asked them why they would not work, and they said: "Me no go where owl be, owl [image of] death." I learned after-

wards that the Sioux, like most Indians, consider the owl the evil spirit death. And that when it screeches or hoots it is calling some one to die.¹

54. *Bubo virginianus*. GREAT HORNED OWL.—When doing research work in geology in the Robinson Bad Lands in July I came on to two of these birds sitting on a branch of a leaning red cedar back in a narrow deep ravine. The birds did not see me till I was right under them. I tried to get them for specimens for my collection, but as I did not have my gun with me they escaped. I searched for a nest, but was unable to find any. These were the only birds of the species seen.

55. *Speotyto cunicularia hypogæa*. BURROWING OWL.—These birds are abundant in the prairie dog town districts. Peculiar for an owl, on hot days they come out of their burrows and sun themselves, sitting usually on fence posts if there are any near their places of residence.

56. *Dryobates villosus*. HAIRY WOODPECKER.—This bird is a common resident both in summer and winter. Both in the fall and in the spring they are usually found in company with the Long-tailed Chickadee.

57. *Dryobates pubescens*. DOWNY WOODPECKER.—A common resident.

58. *Sphyrapicus varius*. YELLOW-BELLIED SAPSUCKER.—Rare.

59. *Melanerpes erythrocephalus*. RED-HEADED WOODPECKER.—Rare.

60. *Centurus carolinus*. RED-BELLIED WOODPECKER.—Common.

61. *Colaptes auratus luteus*. FLICKER.—Very common.

62. *Chordeiles virginianus henryi*. WESTERN NIGHTHAWK.—This bird is one of the most common large birds of the country. I found a nest in the potato patch. The female was on it when I found it. She dragged herself over the ground, fluttered and squawked. At length I scared her so that she flew. I then found that she had been dragging her eggs under her as she drew herself over the ground. There was nothing, however, that could be called a nest except a little hollowed out place. There was neither stick, straw, nor feathers to mark the place. The eggs were two in number and were of a dirty mud color.

63. *Trochilus colubris*. RUBY-THROATED HUMMINGBIRD.—Common in summer.

64. *Tyrannus tyrannus*. KINGBIRD.—Summer resident; abundant.

65. *Sayornis phœbe*. PHŒBE.—I saw but few of these birds, and no nests at all.

66. *Contopus virens*. WOOD PEWEE.—A common summer resident.

¹ This Sioux belief calls to my mind an incident that occurred when I was among the Apaches of Arizona. One morning an Indian came to my house and with great anxiety said: "Me family all die." I asked if they were sick, supposing that possibly they had the smallpox, as that disease usually proves fatal to an Indian. "No," he remarked, "but an owl lit on me tepee last night and hooted. Me away; me family in tepee. Me family all die before the leaves come again." And his family did die within the year, his wife and three children died with consumption. But it was not because the owl called them that they died. They killed themselves drinking Indian whiskey and exposing themselves while they were under its influence. But the Indian to this day will tell you that the owl took them.

67. *Contopus richardsonii*. WESTERN WOOD PEWEE.—A rare summer resident.

68. *Pica pica hudsonia*. AMERICAN MAGPIE.—This bird is a resident throughout the year, but more numerous in winter.

There were so many of these birds about the school in the spring that it became necessary to kill some of them, because they were making themselves such a pest. I had killed only a few when all disappeared. I thought that they had migrated from the region, but later I found them nesting in White River valley. They knew that they were being killed, so left the immediate vicinity of the school.

These birds alight on the backs of horses and cattle and peck holes through the hide and eat the flesh out. Still worse, if a horse has a sore back made by saddle or harness they will perch themselves on him and eat the flesh out till he dies. If the poor creature tries to switch or rub off the pesterer, the bird simply hops to the other side of the animal and begins to peck there. This is kept up till the tortured animal gives up in despair. The bird then eats his fill. The work of these birds, however, is not always a detriment. I have seen them pick grubs from cows' backs by the hour.

69. *Cyanocitta cristata*. BLUE JAY.—A common resident.

70. *Corvus brachyrhynchos*. AMERICAN CROW.—An abundant resident.

71. *Agelaius phoeniceus phoeniceus*. RED-WINGED BLACKBIRD.—These birds are very abundant in migration, but in residence rare; I found only one nest.

72. *Agelaius phoeniceus fortis*. NORTHERN RED-WING.—Common in migration.

73. *Xanthocephalus xanthocephalus*. YELLOW-HEADED BLACKBIRD.—This bird is an abundant resident as well as a migrant.

74. *Molothrus ater*. COWBIRD.—An abundant summer resident.

75. *Sturnella magna magna*. MEADOWLARK.—An occasional resident.

76. *Sturnella magna neglecta*. WESTERN MEADOWLARK.—This bird is an abundant resident. While it looks like *S. magna magna*, it is very different in action. Its song is *tung-tung-tungah-til'-lah-tung*, its warning call *tuck*, its warning whistle *whah-o*, its sympathetic call *tyar*. It flies by a trembling flutter of the wings.

77. *Icterus spurius*. ORCHARD ORIOLE.—Resident in summer.

78. *Icterus galbula*. BALTIMORE ORIOLE.—A summer resident.

79. *Quiscalus quiscula æneus*. BRONZED GRACKLE.—Abundant in summer.

80. *Passerculus sandwichensis alaudinus*. WESTERN SAVANNA SPARROW.—Very common.

81. *Coturniculus savannarum passerinus*. GRASSHOPPER SPARROW.

82. *Spizella socialis*. CHIPPING SPARROW.

83. *Spizella pusilla arenacea*. WESTERN FIELD SPARROW.—Common summer resident.

84. *Junco aikenii*. WHITE-WINGED JUNCO.—A rare winter visitor

85. *Junco hyemalis*. SLATE-COLORED JUNCO.—Common in winter.
86. *Junco hyemalis shufeldti*. SHUFELDT'S JUNCO.—Common in winter.
87. *Calamospiza melanocorys*. LARK BUNTING.—These birds are an abundant resident in summer. Both in fall and spring they fly around in flocks like blackbirds. In the summer they are seen in pairs only.
88. *Passer domesticus*. ENGLISH SPARROW.—These birds are just beginning to enter the region. They are driving the Bluebirds out of the country wherever they appear.
89. *Piranga erythromelas*. SCARLET TANAGER.—Common in summer.
90. *Piranga rubra*. SUMMER TANAGER.—Summer resident; rare.
91. *Petrochelidon lunifrons*. CLIFF SWALLOW.—Summer resident; common.
92. *Hirundo erythrogastra*. BARN SWALLOW.—These birds are an abundant summer resident in the vicinity of the Ring Thunder Day School; I saw but few of them at any other place.
93. *Riparia riparia*. BANK SWALLOW.—Very common along the banks of White River.
94. *Lanius borealis*. NORTHERN SHRIKE.—Common in winter.
95. *Lanius ludovicianus excubitorides*. WHITE-RUMPED SHRIKE.—Common in summer.
96. *Dendroica aestiva*. YELLOW WARBLER.—An abundant summer resident.
97. *Seiurus motacilla*. LOUISIANA WATER-THRUSH.—Rare.
98. *Setophaga ruticilla*. AMERICAN REDSTART.—Common in summer.
99. *Salpinctus obsoletus*. ROCK WREN.—Common in broken districts.
100. *Toxostoma rufus*. BROWN THRASHER.—Common in summer.
101. *Troglodytes aëdon aztecus*. WESTERN HOUSE WREN.—Rare.
102. *Parus atricapillus*. CHICKADEE.
103. *Parus atricapillus septentrionalis*. LONG-TAILED CHICKADEE.—The two species of chickadees are very common, the latter being the most abundant. They are found most usually in company with the Hairy Woodpeckers. They are very busy birds and are always keeping up their peculiar chatter. They seem to prefer the elm trees to all others when looking for food.
104. *Hylocichla mustelina*. WOOD THRUSH.—Rare.
105. *Hylocichla guttata pallasii*. HERMIT THRUSH.—This bird is very rare; I found but one nest.
106. *Merula migratoria*. AMERICAN ROBIN.—The Robin, though one of the first migrant birds to appear in the spring and the last to leave (the school children captured one December 20), is very rare.
107. *Merula migratoria propinqua*. WESTERN ROBIN.—Rare.
108. *Sialia sialis*. BLUEBIRD.—Common.

CHANGES OF PLUMAGE IN BUTEO SWAINSONI.

BY E. S. CAMERON.

My attention has just been drawn to some observations of Mr. P. B. Peabody on the above subject in 'The Condor' for November-December, 1907. I am sorry to refer to them at such a late date, but the fact is I have only recently seen this number of the magazine through the courtesy of one of its editors. Mr. Peabody concludes an interesting article on Prairie Falcons with the following remarks: "As for albinism, however, the writer is inclined to believe Mr. Cameron in error (see 'The Auk,' July, 1907) in believing that the Swainson Hawk normally blanches with age. I have never seen but one such (in Kansas, May, 1907); yet I have seen many melanists. Moreover, Mr. Cameron has seen hundreds of normals to my one; yet he, by his own admission (*loc. cit.*), has never seen but two blanched Swainson Hawks!" This is entirely to misquote my statement and misinterpret my meaning. What I really wrote in 'The Auk' (Vol. XXIV, p. 262) was as follows: "In color, as far as could be determined, these buzzards exhibited every shade of brown, while some inclined to a more chestnut hue. Others again appeared black, or almost black, showing the melanistic form, and a very few individuals were a uniform lavender, or bluish ash, like the male Marsh Hawk (*Circus hudsonius*). I have never obtained but two birds in this rare dress, but I feel satisfied it is the one ultimately assumed by the adult male, which through a long succession of browns moults into a mature plumage of lavender with white throat spot. Of this cinereous phase I can find no reference in ornithological works, where the old males are invariably, but I believe quite erroneously, described as brown. The immature birds, both male and female of the same age, also exhibit endless difference in coloration, and the attempt to trace their progress to maturity has perplexed even so eminent an authority as Dr. R. Bowdler Sharpe who states (*in lit.*): 'The changes of plumage in these buzzards are terribly difficult to follow.'"

As I am not a collector, either of skins or eggs, I scarcely ever shoot a bird, least of all, in the breeding season. When I wrote "I have never obtained but two birds," etc., I meant that I had

only shot two specimens of this type, certainly not that I had only seen two, as Mr. Peabody phrases it, and in the line immediately above I distinctly state that I did see a very few individuals of a uniform lavender on the particular occasion referred to. At the same time I admit that the expression "have never obtained" is open to misconstruction, and am glad to have this opportunity of explaining it. During my nineteen years' residence here, I have seen (as Mr. Peabody says), many hundreds of these hawks,¹ and amongst them not two but a considerable number of bluish ash or lavender examples. I have no doubt that I could easily have obtained a dozen skins of the latter, and also the complete series necessary to show the progress to maturity from the brown and chestnut fledgling to the adult lavender colored male.

This color phase has no more connection with albinism than has the cinereous shade of the adult Marsh Hawk, and is accomplished by a normal succession of moults. In my opinion *B. swainsoni* requires four or five years to assume the full adult dress, as is the case with the Golden Eagle (*Aquila chrysaetos*) and others of the family. I have never myself seen an albino example of Swainson's Hawk.

Some of these hawks breed regularly in my vicinity every year. Two pairs nested here this summer. In June, 1893, a pair made their nest in a white ash tree, in the fenced pasture adjoining my ranch. Both of these were shot. The male was of the light cinereous form with white throat spot, identical with the one obtained in April, 1890, and now in the British Museum. In 1899, I had three nests under constant observation and made voluminous notes. The three cock birds were all quite different, but more or less of a brown coloration, and owing to my intervention none of the hawks were molested. One of these males was as described by Coues,—with the primaries and tail feathers "strongly slate-colored," the whole of the underparts white, streaked with chestnut, and the white throat "immaculate." I have supposed this plumage to be intermediate between the extreme dark brown and bluish gray forms. Dr. Coues, who examined forty specimens, had obviously never come across the light, slate-colored birds. He

¹ On a rough estimate I must have seen about 2500 of this species at the migration periods.

might easily have missed them for he writes: "I took no specimens in the melanistic state of plumage in which the bird has been described as another supposed species (*B. insignatus*); and only saw one in which the entire underparts looked as dark, when the bird was sailing over me, as the pectoral band of the adult female is."¹ "These melanistic birds are by no means uncommon. In the great irruption of April, 1890, I saw numbers of them. The above mentioned writer also states (*op. cit.*): "In both sexes, and at all ages the eye is brown, but of varying shade. I have seen no approach to a yellow iris." This is true of all the brown males, but the bluish ash specimens, to which I refer, have brownish yellow irides, with orange legs, feet and cere. The females and immature birds on the other hand, have pale hazel irides, the legs, feet, and cere being chrome yellow. The eyes are blue gray in the newly fledged young, which color probably changes before the end of the year.

Among the twelve examples shot in April, 1890, out of one flock eleven were females and immature birds while the 12th, of the lavender type, appeared to be an adult male. As previously stated six of the skins were sent to Dr. P. L. Selater who wrote (referring to himself and Dr. R. Bowdler Sharpe): "We have come to the conclusion that they are all correctly determined."

Since learning more about these birds, I regret not having obtained and forwarded to him a large series with a view to clearing up the difficulties connected with their mutability of plumage. Subsequently to April, 1890, when the immense buzzard host was observed, I have met with other small migrations. It does not surprise me that only a small percentage of cinereous males are seen, as in all large bird flocks of different sexes and ages the immature young greatly predominate. Nevertheless, out of the fourteen examples shot by me two were cinereous birds, which gives a proportion of fourteen percent. without taking the females into consideration. If Swainson's Hawk employs similar methods of nest building, and meets with similar persecution elsewhere as in Montana, it is no wonder that few birds reach maturity. I have never known these hawks to take poultry of any kind although they are frequently about ranches. This forbearance, however,

¹ Birds of the Northwest, 1874, p. 357.

does not save them in my neighborhood, where all large hawks, lumped together under the name of hen-hawk, have their nests destroyed, and their young ruthlessly stoned at sight, even if the parent birds escape being shot. Swainson's Hawk is the worst sufferer of any, because it builds conspicuously in a low tree on the prairie right in the way of passing ranchmen and others, whereas the Red-tail has its nest at an inaccessible height and generally escapes molestation. Like the last mentioned bird, a pair of Swainson's Hawk will return to the same tree year after year and repair their old nest, nor will they build a new one unless the other should be entirely demolished.

If the light-colored birds referred to are not the adult males as I maintain, what then are they? While *B. swainsoni* is well known to show every variation of brown, it is rather difficult to believe that some individuals eventually become bluish ash and others do not. I hope to return to the subject at a future date when I can submit skins in support of my contention.

GENERAL NOTES.

Breeding of the Loon in Pennsylvania.—It gives me considerable pleasure to be able to add the Loon (*Gavia imber*) to the list of birds known to breed in Pennsylvania. At various times unauthenticated rumors of this bird's occurrence in summer have been heard, but my record is positive and extends the breeding range of the Loon a number of miles to the southward.

The nest in question was found by Mr. Chas. Homan in late May on a large lake near Bushkill, Monroe County. Mr. Homan, who is perfectly familiar with the bird, has kindly favored me with the details and, moreover, accurately described the birds and the eggs to the writer.

The nest was located on a mass of floating rubbish about fifty feet from the shore of the lake. The birds were frequently seen about the nest and though the two eggs were frequently handled by Mr. Homan they were not deserted. The young hatched in safety but disappeared a short time afterward, although the old birds are still on the pond (July 26).

Not knowing the rarity of the nest he had found, Mr. Homan failed to secure the eggs but offered to take one of the birds for me. However, I persuaded him to protect them, and it is to be hoped that the birds will return next year in safety.—RICHARD C. HARLOW, *LaAnna, Pike Co., Pa.*

A Note on the Audubon Shearwater.—On July 30 and 31, a severe hurricane passed the North Carolina coast, with high southeast to southwest winds. While the writer was collecting on Fort Macon Beach, near Beaufort, N. C., August 1, he found two specimens of the Audubon Shearwater (*Puffinus lherminieri*). One, which was dead, had been dragged by a sand-crab (*Ocypoda albicans*) to the mouth of its burrow, where the crab had commenced to feed on the carcass. The other shearwater was found at the distance of half a mile from the first. Although this second one was alive, it made no resistance to capture; it seemed to be exhausted. The writer carried the bird to the Marine Laboratory of U. S. Fisheries, where it died in spite of attempts to revive it. Both specimens were full grown and measured twelve inches in length.—BARTGIS MCGLONE, *Annapolis, Md.*

'Lead Poisoning in Ducks.'—Conditions similar to those described by Mr. J. H. Bowles for the Misqually Flats, Puget Sound, exist at Lake Surprise, Texas. To the latter locality, Canvasbacks resort from November to March. About the first of January, each year, many of these ducks are found among the rushes along the shore in various stages of sickness. Some can dive, but cannot fly, and all become emaciated. A part of these, of course, are cripples, but most of them, although free from wounds, are plainly diseased, and according to the belief of those who have had most experience with them, the cause is lead poison from shot in the gizzards. No fewer than forty shot have been taken from a single gizzard and the shot generally bear evidence of more or less attrition. As the season advances, the diseased ducks gradually disappear; the greater part die, but some, it is thought, recover. According to the information at hand, no other species than the Canvasback, is thus affected at Lake Surprise.

Ducks secure a great deal of their food by sifting mud through their bills; if shot are abundant in the mud, it is not hard to understand how the birds may collect a considerable number in a day. Resisting digestion to a marked degree, as shot do, the quantity in the gizzard is added to day by day, the ducks continuing to feed over the same grounds, until finally, the gizzard is clogged with shot, and malnutrition, if not actual poisoning, ensues. Epidemics such as we now have evidence of on Puget Sound and at Lake Surprise, in all probability will increase in number, adding another to the almost overwhelming array of unfavorable conditions, against which our ducks must more and more hopelessly struggle.—W. L. McATEE, *Washington, D. C.*

Masked Duck (*Nomonyx dominicus*) in Chatham County, Georgia.—By permission of Mr. G. R. Rossignol, Jr., of Savannah, I take pleasure in making a note of the capture of a young male Masked Duck (*Nomonyx dominicus*) near Wilmington Island in Chatham County on October 5, 1906. It was taken by a young hunter and turned over to Mr. Rossignol and is now in his collection.—ISAAC F. ARNOW, *St. Marys, Ga.*

Black Brant and Marbled Godwit on Long Island, N. Y.—On March 31, 1908, in a heavy southeaster, while lying in a battery for Brant in the Great South Bay, near Babylon, L. I., a flock of seven came to the decoys. All were seen plainly. Six were of the common variety, while the seventh was so much darker in appearance than the rest, that I immediately shot and secured it. The bird proved to be a remarkably fine old male Black Brant (*Branta nigricans*). I think this is the first Long Island record in a number of years.

The Great Marbled Godwit (*Limosa fedoa*), while never common on Long Island, has become now quite rare, so I wish to record a specimen taken by my brother, Harold E. Herrick, at Lawrence on August 21, 1907, and another taken by myself at the same place July 21, 1900 — NEWBOLD L. HERRICK, *New York City*.

Ardea egretta in New Jersey.—On July 6, 1908, my friend Mr. Ralph B. Romaine of New York shot at Black Point, Rumson Borough, Monmouth Co., N. J., an America Egret (*Ardea egretta*). The bird was in company with another which Mr. Romaine writes me "stayed around until about a week ago (July 24) when it was shot, by whom, or where, I do not know."

The specimen was not sexed by the taxidermist, and is now mounted and in the possession of Mr. Romaine, 'The Ledges,' Seabright, N. J.—REGINALD HEBER HOWE, JR., *Concord Mass.*

American Avocet (*Recurvirostra americana*) in Camden Co., Georgia.—As I know of no other record of the American Avocet (*Recurvirostra americana*) having been taken in Georgia, and am quite sure no other has been taken in this county, I would like to make a note of one taken by me on Oct. 8, 1903, and now in my possession. When taken it was feeding, in its peculiar way, in shallow water on the river front at the foot of one of the streets in St. Marys. It proved to be a female.—ISAAC F. ARNOW, *St. Marys, Ga.*

Bartramian Sandpiper in Wayne Co., Michigan.—In 'The Auk' for July, 1908 (p. 328), Mr. P. A. Taverner records a Bartramian Sandpiper (*Bartramia longicauda*) for Wayne County and says, "This bird had been deemed extinct in the County for some years." It is true that in the more densely populated districts along the Detroit River this sandpiper was obliterated, as a breeding bird, some twenty years ago and seems unable to reinstate itself, which probably explains its gradual extermination in many portions of the eastern States where formerly abundant, but in the northwestern portion of Wayne County it is still a summer resident. While tramping across the county in the early summer of 1907 Mr. Herbert H. Spicer and the writer met with it in Canton Township, and Mr. Robert C. Alexander collected a set of eggs in Livonia Township. Mr. James B. Purdy of Plymouth once treated the writer to a verbal description of its

nesting habits in Plymouth Township, mentioning the male as frequently uttering its love notes while wheeling high in the air, and describing the solicitude of the adults for their young. The writer recently wrote him for more accurate data and his reply under date of July 17, 1908, is in part as follows: "I first discovered the Bartramian Sandpiper in the spring of 1873 — a single pair — and whether they bred or not that year I cannot say. I did not see them again for some years but for the past fifteen years they have been a constant breeder at this place. I have two sets of eggs collected here; one set of three taken May 5, 1899, and one set of four taken May 10, 1899. The first set was fresh and the second slightly incubated. They were in the same field within ten rods of each other. Another set was found here but I did not get the particulars. The birds have been with us here all this spring, but are at present hiding in the tall grass and hay fields. Would like to have you see their peculiar actions while nesting and hear them whistle while in mid air."

PINE SISKIN, *Spinus pinus*.— In the same note Mr. Taverner also conveys an erroneous impression of the local status of the Pine Siskin. The writer has observed more than a hundred during the last eighteen years, mainly in the northeastern portion of the county. The bird is less abundant and even more erratic than the Redpoll.— J. CLAIRE WOOD, *Detroit, Michigan*.

Krider's Hawk and the English Sparrow Nesting Together.— During a recent trip to the Dismal River in the Sand Hill region of northwestern Nebraska, I found, some fifteen or sixteen miles away from any habitation, a nest of Krider's Hawk from which I took on May 25 two well incubated eggs. One was beautifully colored while the other was immaculate. In the lower part of the nest, which was constructed of coarse sticks, a pair of English Sparrows were nesting. I did not take either of the hawks, believing it a crime to destroy such a beautiful bird that is now so rare. The male was rarely seen, but the female might easily have been shot when flushed from the nest. She was exceedingly wild and elusive and when flushed did not return to the nest for a considerable time, and then by a round-about course, and with great caution. I had the pair under observation for two days before taking the eggs.— JOHN LEWIS CHILDS, *Floral Park, N. Y.*

Migration of Hawks.— In Mr. Justus von Lengerke's note on 'Migration of Hawks' (Auk, XXV, pp. 315-316), the line of migration is described as toward the Delaware Water Gap and, as my observations covered that portion, I would like to report what I saw in 1904 while living in Shawnee, four miles up the river.

The line of flight for hawks, and also other birds, such as Crows, Black-birds, Nighthawks, etc., was down the west side of the river just below the crest of the hills until reaching a point about two miles above the Gap, when they would invariably rise over a low corner of the hills and pass on

to the southwest by west going north of the Kittatiny Mountain range. No birds were observed to go through the Gap, though I would not say that none do.—BRUCE HORSFALL, *Princeton, N. J.*

Turkey Buzzard (*Cathartes aura*) in Northern Illinois.—On June 28, 1908, I watched one of these buzzards circling over the links of the Exmoor Country Club at Highland Park. It is rarely seen so far north in the State. Mr. Benj. T. Gault recorded three seen in the city of Chicago, April 1, 1896 (Wilson Bull., No. 9, July, 1896), and there is a mounted specimen in the collection of the Academy of Sciences, Chicago, which was taken at Worth, Ill., several years ago.—RUTHVEN DEANE, *Chicago, Ill.*

Pileated Woodpecker near Litchfield, Conn.—To-day (June 20, 1908), while driving near my home in Litchfield, Conn., I had the good fortune to see a fine specimen of the Pileated Woodpecker (*Ceophlæus pileatus abieticola*). It was on the wing and high up when I first saw him, and beginning to cross, almost at right angles to our course, a deep valley which we were to drive through lengthwise. He was far off when first seen and my attention was attracted by his lazy, even flight and his great size. But his flight soon brought him directly over our road and a little way in front of us. Then I could see the great white markings on his wings. The bird flew on across the valley and with a swoop, which ended with an upward curve, entered the foliage of a large maple, which stood upon the mountain side, making for its trunk. He had alighted too far up the valley side for me to follow up the search, and, indeed, there was no need for this because his markings and manner of flight had made the identification plain. The region is extremely wild and rugged, in the Berkshires.—JOHN HUTCHINS, *Litchfield, Conn.*

Nelson's Finch in the Mountains of Virginia.—Some light may be thrown upon the line of spring migration of *Ammodramus nelsoni* by its occurrence in Montgomery County, Virginia, in May. Dwight, in 'The Auk' for October, 1896, speaks of the breeding of this species in Illinois, Wisconsin, Minnesota, Kansas, Dakota, and Manitoba; its occurrence as a fall migrant on the Atlantic Coast from Massachusetts to South Carolina, and adds that spring records are few and far between.

My house on the Campus of the Virginia Polytechnic Institute at Blacksburg, Va., is near a low meadow, flooded in winter as an ice pond, and in spring and summer rank with a marsh-like growth of grass and weeds; it affords a hunting ground for my cat, who frequently brings field-mice into the house to eat. On the evening of May 23, 1908, I surprised the cat with a bird which he dropped. I always confiscate his bird-catches for 'Audubonic' reasons, and picked this up thinking it a Yellow-winged Sparrow. To my surprise I saw it was a Sharp-tailed Finch, and on comparing with a series of Nelson's Finches and Sharp-tailed Finches taken

by me in October in the marshes around Charleston, S. C., I realized that the bird was Nelson's Finch. It was an adult female, very bright and fresh in color; ova about the size of No. 10 shot; and save for the loss of a few back feathers, in excellent condition. The skin is now in my collection (No. 1379). If I had been out collecting, with no special thought for this species, and had seen the bird as it would probably have appeared in the high grass, doubtless I would have passed it by for a Yellow-winged Sparrow. They may therefore occur here every spring on their passage North. I searched the meadow carefully during the next two days, but saw nothing further of the species. It may therefore have been an accidental occurrence, the knowledge of which is due to the ornithological discrimination of my maltese cat.—ELLISON A. SMYTH, JR., *Blacksburg, Va.*

Lark Sparrow (*Chondestes grammacus*) in **Camden County, Georgia.**—On the afternoon of August 11, 1908, I noticed a sparrow sitting on the wire fence of my field, and at first took it to be a Vesper Sparrow that had arrived ahead of time but on closer inspection I saw the difference and shot it. It proved to be a male Lark Sparrow (*Chondestes grammacus*) and is now in my collection.—ISAAC F. ARNOW, *St. Marys, Ga.*

Lark Sparrow (*Chondestes grammacus*) in **Southwestern Pennsylvania.**—On June 22, 1908, at Leetsdale, Pa., I observed a Lark Sparrow (*Chondestes grammacus*) hopping along the public road in company with several Vesper Sparrows. I at first mistook it for one of the latter, but as it flitted to a nearby fence the fan-shaped, white-tipped tail attracted my attention, and I recognized the bird. On the next day I saw another of the birds on the road making active attempts to catch a small butterfly, and I secured the specimen. On June 24 I secured another specimen in a stone quarry along a narrow road through a woods, this being the last bird of the species seen, although I looked carefully for them. Both birds taken were males in rather worn plumage, and the testes in the last specimen were greatly enlarged.

The Red-headed Woodpecker (*Melanerpes erythrocephalus*) is very rare in this locality this season, but most all other birds appear to be on the increase.—WM. G. PITCAIRN, *Allegheny, Pa.*

Chondestes grammacus at Ipswich, Mass.—I wish to record that on August 28, 1908, Miss E. D. Boardman and I saw in a newly planted field at Ipswich, a fine Lark Sparrow. The bird was associated with Chipping, Vesper and Song Sparrows. We were attracted at once by the curious face markings, the unstreaked breast with the small black spot, the rounded tail tipped with white, the outer feathers with much white. These details were all carefully noted at a distance of fifteen feet, as the bird was feeding. Having seen them in the West I knew it was a Lark Sparrow, the second record, I believe, for Ipswich.—LIDIAN E. BRIDGE, *West Medford, Mass.*

A Tame Field Sparrow.— An unusual experience with a Field Sparrow (*Spizella pusilla*), had while in camp near Paul Smith's, N. Y., this spring, seems worthy of note. I will transcribe from my note-book the account of it made at the time.

"May 3, 1908.— Last night and early this morning there was a heavy fall of snow, covering the ground to a depth of 8 to 10 inches. The birds had a hard time of it and a number of Juncos and Chipping Sparrows took refuge in our tents during the night. In the morning there were fifteen or twenty birds — Juncos, Vesper, Chipping, and two Field Sparrows — searching for food about the tents, so, about ten o'clock, I scattered bread crumbs and some grass seed which we happened to have in camp. While doing this one of the Field Sparrows, a female, hopped right up to me, paying no heed to my presence or movements, hopped on to my feet when I stood still, allowed me to walk rapidly up to her, kneel down and stroke her with my hand, in fact permitted me to handle her quite roughly without showing the slightest sign of timidity. Once I pushed her away from the seed, but she would not go and instead actually forced her head under my fingers, raising them up in order to reach the seed beneath them. Another time she squeezed herself in between my knees while I was kneeling on the ground, and fed on some seed beneath me. The presence of other people did not frighten her, for four of my men came up to watch me and she permitted them also to touch her — all the time feeding as busily as she could.

"Her fearlessness was probably not due to hunger alone, for after having eaten all she wanted, she perched herself on a heap of straw under a tent-fly close by, tucked her head under her wing and went to sleep. Ten or fifteen minutes later I woke her up, whereupon, after preening herself for a minute or two, she flew over to me and resumed feeding from my hand. Swift and sudden movements on my part, such as casting seed, would not frighten her in the least, even though my hand might pass within a few inches of her. Several times pieces of bread or seed would strike her quite forcibly, but even that would not disturb her. The other birds were all comparatively shy, the other Field Sparrow, a male, particularly so, though a few would allow me to approach within eight of ten feet of them. The grass seed was invariably taken in preference to the bread crumbs." — E. SEYMOUR WOODRUFF, *State Forester, Albany, N. Y.*

Destruction of English Sparrows.— Many unsuccessful attempts have been made to reduce the numbers of these pests. Fire-arms cannot be used within the city limits, the bounty law proved a failure and the free use of poisoned grain, except in certain isolated sections, would include too many of our native species. The balance of nature's forces, however, sometimes weighs a little in our favor, though unfortunately such occurrences are too few and far between.

At 8:40 P. M. August 11, 1908, Chicago and vicinity were visited by a

torrent of rain which is seldom exceeded in force or quantity. The down-pour continued with but little cessation until 3:55 A. M. the following day, during which time 3.30 inches of rain fell. No hail accompanied the storm and the temperature averaged 72°. The storm was evidently more severe in certain sections of the city, as the Superintendents of some of the parks and cemeteries have communicated that the destruction of Sparrows was not noticeably large. The daily papers reported that two thousand were gathered and buried by the school children in the vicinity of West 60th and Ada Streets. Of this I have no authentic record, but I am much indebted to Mr. Luther E. Wyman for an account of his personal observations which were made the morning following the storm. Mr. Wyman writes:

"An unusual disaster to bird life came in the form of the terrific storm that visited Chicago and vicinity on the night of Aug. 11th. On the following morning residents of the West and South sides, where the storm was most severe, reported great numbers of dead sparrows on walks and pavements. In the vicinity of 64th Street and Harvard Avenue the destruction was so severe that an observer states there were not enough sparrows left on the following night 'to make a cheep.'

"My own observations were confined to Garfield Park, where they roost in great numbers. Here I found them dotting the grass under the trees, but massed around the trunks of the larger trees, though many lay even under such dense-growing shrubs as the lilac. The majority, however, were found within eighteen inches of the tree trunks, most numerous on the side away from the wind, and of these probably ninety per cent. lay with heads toward the trees, as though when beaten from the branches by the rain they had instinctively fluttered toward the trunk, or had hopped toward it in the grass, only to be actually drowned by the incessant down-pour. The area I examined would cover probably less than a third of a city block, yet I found upward of a thousand birds, all sparrows but one,—a young robin. A Yellow Warbler, however, that has haunted this section all summer, escaped the storm, as evidenced by his cheerful song."—RUTHVEN DEANE, *Chicago*. '11.

Swainson's Warbler and Chuck-will's-widow Breeding North of James River, Virginia.—On the 31st of May, 1908, I found the nest and three eggs of the Swainson's Warbler (*Helinaia swainsonii*) in Warwick Co., Virginia. The location was about thirty feet from the head of a mill pond, in some second growth bushes in a clearing in woods. The nest was placed between two upright main branches of the bush, about 5½ feet above the ground, and composed of dry birch leaves, fine weed stems and seed tops, lined with very fine rootlets and straws. Both birds were very tame and kept up a constant chipping while the nest and eggs were being securely packed away. Visiting this locality again two weeks later in hopes to find that a second attempt at breeding had been made, I was not disappointed by finding a new nest similarly located not far

distant from where the first one was found, and composed of the same materials. Both birds were very attentive, and while I was very careful not to touch the nest when looking into it, a week later on visiting the spot, I found the nest deserted. The eggs in the first case were quite fresh. Although this place and similar localities have been worked almost yearly, for the last fifteen or eighteen years, this is the first instance of the birds' breeding in this section of the State that has come to my knowledge.

On May 23, 1908, my father, H. B. Bailey, found on my place in Warwick Co., Virginia, a set of two eggs of Chuck-will's-widow. As this was not far from the house, he secured a gun and shot the female, which was in fair plumage, notwithstanding the eggs were heavily incubated. The eggs were deposited on the bare ground in woods that had been previously burnt over. This is the first time we have ever secured positive proof of this bird breeding in this locality, and I believe this case, as that of the Swainson's Warbler, are first records for these birds breeding north of James River.—H. H. BAILEY, *Newport News, Va.*

Bachman's Warbler in Camden Co. and Breeding in Chatham Co., Georgia.—As anything in reference to Bachman's Warbler (*Helminthophila bachmani*) is of interest, I will say that I have at last found it here (as a migrant) and taken three specimens. About noon on August 14, 1908, I took an immature male and an immature female feeding about 15 to 20 feet up in a thicket of young oaks. They were in company with Carolina Chickadees, Blue-gray Gnatcatchers and Parula Warblers. The next day I took a mature female about the same place, and in the same company with the addition of Yellow-throated and Prairie Warblers and Painted Buntings.

On June 21, 1908, Mr. Gilbert R. Rossignol, Jr., of Savannah, found a nest containing one egg in Chatham County. On the 24th he returned and found that the nest contained three eggs, but he did not see the bird. Prof. W. J. Hoxie, who was with him, however, both saw and heard the bird and took it to be Bachman's Warbler. I have compared these eggs with eggs of Swainson's Warbler and found them not only much smaller but with a gloss never seen on the latter. The nest was placed in a cane about two feet from the ground in a swamp, and was composed of sweet-gum leaves, fine grass, etc., lined with dead Spanish moss. Both nest and eggs are now in Mr. Rossignol's collection.—ISAAC F. ARNOW, *St. Marys, Ga.*

Cape May Warbler in Camden County, Ga.—The Cape May Warbler (*Dendroica tigrina*) is found here both as a spring and fall migrant but is always rare. The spring migrants pass through about the middle of April (specimens taken this spring, 1 ♂, April 17, 1 ♀, April 18), while the only fall records I have were unusually late in comparison with records from other points in Georgia and Florida. These were two birds taken on Oct. 31, 1905—one mature and one immature female.—ISAAC F. ARNOW, *St. Marys, Ga.*

The Kirtland and Pine Warblers in Wayne Co., Michigan.—For years I have looked for the Kirtland Warbler (*Dendroica kirtlandi*) here in Wayne County and have twice met with birds that I thought were this species but under conditions not entirely free from an element of doubt and no record was made of them in consequence. May 30, 1907, however, I identified a Kirtland's Warbler to my entire satisfaction. On Section 5, Hamtramck Twp., there are several ridges covered with small hazel bushes but recent fires had killed these and wiped out all weed growth, leaving a desolate appearance. When first seen the bird was perched on a dead hazel near the top of one of these ridges. It was very tame, or rather indifferent, and when forced to flight, crossed to the next ridge and allowed a second near approach. The main points of distinction were size, plain colors, tameness, silence and an occasional ovenbird-like jerk of the tail. Having taken thirty-three species of warblers here and given the family close attention the identification may be regarded as good as possible without actually securing the bird.

April 19, 1908, I shot a male Pine Warbler on Section 9, Taylor Twp. This is the first specimen taken in the county.—J. CLAIRE WOOD, *Detroit, Mich.*

The Hooded Warbler a Summer Resident in Greene Co., N. Y.—I observed Hooded Warblers (*Wilsonia mitrata*) on several occasions, between May 20th and July 1, at Palenville, Greene Co., N. Y. (alt. 425 ft.), nine miles west of Catskill. They were also identified by Mr. S. H. Chubb. I also observed a few in the same locality during June, 1907. This seems to prove that the Hooded Warbler is a summer resident in Greene County.—STANLEY V. LADOW, *New Baltimore, N. Y.*

Breeding of the Carolina Wren in Rhode Island.—I have before now communicated to you the fact that the Great Carolina Wren appears to have occasionally bred in southern Rhode Island. This year I am quite sure again that the wren is breeding here, and for the first time that more than one pair have bred in this neighborhood. The post-nuptial song has lately been very noticeable in the morning. On July 13 I distinctly heard two males singing different songs at the same time, or in answer to one another, both being in my garden. They appear to prefer to begin singing about 6 A. M., and it is often continued as late as nine or ten o'clock. This morning, the 29th July, two males have been singing enchantingly, one of them giving the full, ringing note of the Cardinal Bird, and the other a very different, but resonant song, more individual to the wren itself.

Once heard, the quality of the tone is easy to recognize, and I shall hope to hear of other records in this vicinity, and perhaps further north.

I feel that we are to be congratulated upon the regular visits of this very attractive songster, as it is now several years that I have heard them at this season.—R. G. HAZARD, *Peace Dale, R. I.*

The Blue-gray Gnatcatcher in Southeastern Pennsylvania.—In Mr. Stone's 'Birds of Eastern Pennsylvania and New Jersey,' page 148, the Blue-gray Gnatcatcher (*Poliophtila carulea*) is said to be a "Rare summer resident in Southern New Jersey, and much less common in Southern Pennsylvania. Only a rare straggler in the Delaware Valley." In a footnote on the same page: "This species may have bred here formerly, as there is a very young bird in the collection of the Academy of Natural Sciences, obtained near Philadelphia many years ago by Wm. Wood."

I believe the following list is a complete summary of specimens either seen or captured in this vicinity (southeastern Pennsylvania):

One shot at Chestnut Hill, Pa., Sept. 3, 1880, by Dr. W. L. Abbott. (Stone's Birds of E. Penn. and N. J., p. 148.)

One found dead at Frankford, Pa., Apr. 19, 1904, by Richard F. Miller. (Auk, April, 1907, p. 222.)

One seen at Swarthmore, Pa., April 25, 1905, by Dr. Spencer Trotter.

One (probably the same bird) seen at Media, Pa., May 1, 1905, by Philip H. Moore; May 2, by Lydia G. Allen, and May 7, by Alice Fussell. (Casinia, 1905, p. 67.)

One seen at Wayne, Pa., May 18, 1907, by Leonard S. Pearson. (Auk, Oct. 1907, p. 447.)

One female shot at Wayne, Pa., April 18, 1908, by L. S. Pearson. (Specimen now in collection of Mr. Witmer Stone, Acad. Nat. Sci. Phila.)

One male shot at Wayne, Pa., May 2, 1908, by Alfred C. Redfield. Same bird seen by L. S. Pearson on same date.

This makes a total of seven records—one fall capture, three spring captures, and three specimens seen in spring.—LEONARD S. PEARSON, *Wayne, Pa.*

The Hermit Thrush as a Summer Resident of Long Island, N. Y.—

Late in the afternoon of July 13, 1908, while walking along the road between Holbrook and Patchogue, L. I., about two miles from the latter place, I heard a Hermit Thrush (*Hylocichla guttata pallasii*) singing at a distance of about a hundred yards from the road. After stalking it for more than half an hour I was able to secure a good view of the bird with an opera-glass and complete the identification, although the song, with which I was familiar, had been unmistakable from the first. Meantime the bird had been singing continually, except when I would disturb it by approaching too closely. I am quite certain that I heard one other Hermit Thrush singing in the vicinity at the same time.

The locality is densely grown with young white oaks (*Quercus alba*) reaching a height of perhaps twenty or twenty-five feet, together with a few scattered pitch pines (*Pinus rigida*). The underbrush is composed largely of short blueberry bushes. The place is only forty feet above sea level, and three miles distant from Great South Bay.

This seems to be the first adult Hermit Thrush observed on Long Island during the breeding season, though there are two previous records for

immature birds (Dutcher, Auk, III, 1886, pp. 443, 444, and Braislin, Auk, XXIV, 1907, pp. 186-189). Dr. Braislin, in the reference just cited, says, "Further investigation will probably show that the Hermit Thrush is, though rare, a regular summer resident on Long Island."—FRANCIS HARPER, *College Point, N. Y.*

Records from Bloomington, Indiana.—Those who have copies of 'Birds of the vicinity of the University of Indiana' may be interested in the following notes giving additions to the data contained in that paper. All are from the migration record of Dr. W. L. Hahn for the spring of 1908. The Redwinged Blackbird arrived on March 3, one day earlier than previously recorded; the Chipping Sparrow, March 15, one day earlier; the Tree Swallow, March 29, 7 days earlier; Blue-gray Gnatcatcher, March 22 (authority of H. Green), 15 days earlier; and the Mockingbird, February 19, 34 days earlier. The last record is particularly interesting as an indication that the bird may remain at Bloomington during the winter. Certainly winter conditions are no more unfavorable at Bloomington than at other localities where the bird is resident, and we may confidently expect that before many years, the Mockingbird will be added to the already long list of winter birds of Bloomington. In this connection I desire to record the fact that Mockingbirds were rather common in Benton County, Ind., a locality considerably north of the known breeding range, on September 12, 1906.—W. L. MCATEE, *Biological Survey, Washington, D. C.*

New and Unpublished Records from Washington.—In preparing a standard list of the birds of Washington (now numbering, roundly, 375 species) we have not hesitated to accept, on occasion, the first-hand testimony of competent ornithologists, even when unsupported by specimens. A few of our own records, likewise, depend upon the binocular instead of the gun, but when this is the case, the fact is clearly stated.

My thanks are due to several gentlemen, notably to Dr. A. K. Fisher, of the Biological Survey; to Mr. A. W. Anthony, of Portland; and to my colleague, Mr. J. H. Bowles, of Tacoma, for permission to publish many of these presumed "first records." It may well be in some instances that previous publication has been overlooked, in which case the writer would esteem it a favor to be corrected. A list of the birds of Washington prepared by Professor O. B. Johnson, then in charge of the department of Zoölogy in the University of Washington, appeared in the 'Report of the Governor of Washington Territory for the year 1884' (published in 1885). This list enumerates 273 species, including some which appear below; but inasmuch as it was confessedly "popular" (the East-side records especially being partly based on hearsay or inference) and employed only vernacular names, it cannot, unfortunately, be cited as authority.

***Pinicola enucleator alascensis*.** ALASKAN PINE GROSBEEK.—Common breeders in the balsam belt of the Mount Baker district; definitely observed south of the 49th parallel. (Allan Brooks, *in epist.*, Jan. 17, 1907.)

Calcaarius lapponicus alascensis. ALASKAN LONGSPUR.— Unquestionably of ordinary occurrence east of the Cascade Mountains, but the only authentic record appears to be that of a specimen, a female of notably light coloration, taken in Seattle in October, 1907, by Mr. E. H. Jones.

Amphispiza bilineata deserticola. DESERT SPARROW.— A singing male was first seen in the sage-brush near our camp on Brook Lake, in Douglas County, May 31, 1908. He was narrowly observed on several occasions subsequent, and once appeared in company with a female. A male bird was several times sighted through a stretch of half a mile or so along the north shore of the lake, but never more than one at a time, and we could not be sure that above a single pair existed in the county — or indeed in the State.

Melospiza lincolni. LINCOLN'S SONG SPARROW.— Until recently curiously overlooked, although records abound on all sides of us. The first specimen noted was picked up from the ground beneath telegraph wires in Tacoma, May 22, 1906, by A. Gordon Bowles, Jr. This summer (June 28–July 14) I found a breeding colony of some twenty individuals, which occupied the swamp at Longmire's Springs, in the Rainier National Park. The altitude was nearly 3000 feet, and the birds on the first of July seemed to be about evenly divided between care of youngsters out of nest and preparations for a second nesting.

Helminthophila celata. ORANGE-CROWNED WARBLER.— Spec., ♂, by J. H. Bowles, Tacoma, May 8, 1907. (Ident. by Dept. of Agriculture, Washington, D. C.). Believed to be regularly migrant east and west of the Cascades.

Hylocichla ustulata swainsonii. OLIVE-BACKED THRUSH.— Thrushes of the *ustulata* group found along the eastern slopes of the Cascade Mountains have been allowed to pass as *typicus*, although it was presumed that specimens taken in the Kalispell region would prove to be *swainsonii*. To our surprise, Mr. Bowles finds *swainsonii* alone this summer, in the valley of the Stehekin, Chelan County, where they are very common up to 4000 feet. Specimens compared at Washington, by courtesy of Dr. A. K. Fisher.

Hylocichla guttata. ALASKA HERMIT THRUSH.— Two records: Tacoma, April 15, 1905, by J. H. Bowles; Seattle, Sept. 21, 1907, by Jennie V. Getty. Identification by Biol. Surv., Washington, D. C.

Hylocichla guttata sequoiensis. SIERRA HERMIT THRUSH.— Now established as the resident breeding form in the Cascade Mountains, at least west of the divide. Twin Lake, Mt. Baker District, Aug. 9, 1905, by W. L. Dawson.

Dryobates villosus hyloscopus. CABANIS'S WOODPECKER.— One specimen, ♀, Dec. 25, 1895, by Geo. G. Cantwell (J. H. Bowles *in epist.* Ident. by Bureau of Biol. Surv., Washington, D. C.). This identification is made in careful distinction from *D. v. monticola*, which occurs regularly in the northeastern part of the State, and to which the reference in Bendire, Life Hist. N. A. Birds, II (1895), p. 53, is presumed to belong. Others seen at Kirkland by Miss Jennie V. Getty.

Colaptes auratus luteus. YELLOW-SHAFTED FLICKER.—A specimen in Mr. Rathbun's collection was taken by Mr. Matt. H. Gormley on Orcas Island, Oct. 15, 1903. The bird is a male, and is typical, save for the faintest possible tinge of salmon in the yellow. The casual occurrence of this species west of the Cascades during migration is attested by several other witnesses; notably, Mr. D. E. Brown, formerly of Glacier, and Mr. Victor Savings, of Blaine.

Glaux funerea richardsoni. RICHARDSON'S OWL.—A specimen taken on the Nooksack River, near Glacier, Jan. 17, 1905, by D. E. Brown, has been examined by the writer.

Glaux acadicus scotæus. NORTHWEST SAW-WHET OWL.—Dr. A. K. Fisher, *in epist.*, Jan. 18, 1907, identifying specimen secured at Nisqually in Dec. (?) 1906; collection Edwards Bros., Tacoma. The only other recent specimen taken proves to be true *acadicus*.

Grus americana. WHOOPING CRANE.—I should hesitate to report the appearance of a large flock of these white cranes in Yakima County (May 2, 1908) and studied by myself through binocular at a range of *five miles*, were it not for abundant corroborative testimony on the part of ranchers both in Yakima and Douglas Counties. In the Big Bend country, especially this remnant of a vanishing race appears to be making its last stand.

Ægialitis nivos. SNOWY PLOVER.—Specimen taken at Gray's Harbor, Sept. 3, 1899, by C. W. Bowles; now in collection of C. W. and J. H. Bowles in Ferry Museum, Tacoma.

Pisobia aurita. SHARP-TAILED SANDPIPER.—J. M. Edson, *in epist.* Four specimens taken from a flock at Bellingham in September, 1892, carefully identified but not preserved.

Bartramia longicauda. BARTRAMIAN SANDPIPER.—Several times heard in western Walla Walla County near Two Rivers, April 22 and 23, 1905. Having been brought up on the prairie, I could not have been surer of my mother's voice.

Stercorarius pomarinus. POMARINE JAEGER.—"On Sept. 7, 1897, I saw a specimen of *Stercorarius pomarinus* in Puget Sound near Whidby Island, and on Sept. 24 one in Shoalwater Bay." (A. K. Fisher, *in epist.*, April 7, 1908.)

Larus vegæ. VEGA GULL.—Several birds with very dark mantles seen about the wharves and shipping at Bellingham where shooting was impossible. One of these dark-winged birds, resting frequently on the top of a convenient pile, had a foot taken off as by a sharp-edged trap. The bird, however, supported itself freely upon the tarsal stump and apparently made light of its infirmity. Old "Dot-and-go-one" had also an unusually conspicuous spot of vermillion which glowed upon the angle of the lower mandible.

Xema sabinii. SABINE'S GULL.—One seen by Mr. Anthony in January or February, 1899, while cruising off Gray's Harbor. (A. W. Anthony, *in epist.*, Feb. 13, 1907.)

Sterna forsteri. FORSTER'S TERN.—Of regular occurrence on Brook

Lake and on Moses Lake, in Douglas County. Twenty or thirty seen in 1905, 1906, and again in 1908.

Dendrocygna bicolor. FULVOUS TREE-DUCK.—One specimen secured from a flock of ten on Gray's Harbor, Oct. 3, 1905, by Willis G. Hopkins, Esq., of Aberdeen, and now in his possession. It is interesting to note in this connection that a flock of eleven birds appeared at Alberni, B. C. (Vancouver Id.), on the 29th of September of the same year. From this flock five were secured by Mr. J. S. Rollin, a rancher; and one of these, a handsome male, now stands in the Provincial Museum at Victoria.

Puffinus opisthomelas. BLACK-VENTED SHEARWATER.—"Off Cape Flattery in June." (A. W. Anthony, *in epist.*, Jan. 15, 1907.)

Puffinus tenuirostris. SLENDER-BILLED SHEARWATER.—"Off Cape Flattery in October and November." (A. W. Anthony, *in epist.*, Jan. 15, 1907.) In August, 1905, Mr. Bowles witnessed the migration of countless thousands of these birds a quarter of a mile off-shore, at Moclips, and secured specimens.

Oceanodroma furcata. FORK-TAILED PETREL.—"Just off the Cape." (A. W. Anthony, as above.)

Phaleris psittacula. PAROQUET AUKLET. "I have seen it between Port Townsend and Cape Flattery." (A. W. Anthony, *in epist.*, Jan. 15, 1907.)—W. LEON DAWSON, *Seattle, Washington.*

Averaging Migration Dates.—What is the best way of averaging the dates of bird arrivals? This is a question that often arises in connection with the migration work of the Biological Survey.

Commenting on the method used here, Mr. Witmer Stone says (Proc Acad. Nat. Sci. Phila., 1908, p. 138): "As so little has been attempted in the way of combining local migration records, I find it difficult to discuss the comparative value of different methods. Some casual allusions by Prof. Cooke to the methods employed by him, form indeed the only contribution to the subject with which I am familiar. He recognizes the danger of including the latest dates of arrival in computing averages and rejects them, just as I have advocated above, but in deciding how many to reject his method seems to lack definiteness and to involve the personal equation. He says (Auk, 1907, p. 347), 'When using migration records for the calculation of average dates of arrival, I usually discard dates that are more than six days later than the probable normal date of arrival.' This would seem to imply an arbitrary selection of 'the probable normal' date before any averaging is done, which seems to be a dangerous method."

For the benefit of any that are interested in the subject I will give my method in full and if any one can suggest a better, I am open to conviction.

What is desired in our work, is a date that represents the average time of the arrival of the first in normal migration. The securing of such a date requires the rejection of both extra early and extra late dates. The principal problem is the determining of where to draw these limits. My study of the relation of bird migration to the weather has convinced me

that birds seldom vary on account of the season more than six days either way from their average date of arrival. An example will show how this limit of six days is employed. The Hooded Warbler has been reported as arriving at Washington, D. C., on the following dates during fifteen different years: April 19, 26, 27, 27, 29, 29, 30, May 1, 1, 3, 6, 8, 9, 10, 12. The average of these fifteen dates as they stand is May 2. The first rejection drops April 19 as too early, and May 9, 10, and 12 as too late. The average of the remaining dates is May 1. It is now seen that May 8, should also be discarded. The average of the ten dates left is April 30. This date of April 30 is considered as the "probable normal date of arrival," so far as our records stand at the present time, and is published as the "average date of spring arrival" based on ten years' records.

How near this date is to the truth can be surmised from the amount of variation in the records. The differences between each of the ten dates used and April 30 is, in days, as follows; 4, 3, 3, 1, 1, 0, 1, 1, 3, 6—a total of 23, which divided by ten gives 2.3 days as the probable error; *i. e.*, it is probable that the date April 30 is within 2.3 days of correct. The greater the number of observations and the closer these are in agreement, the smaller will be the probable error. Thus in the case of the White-eyed Vireo at Washington, D. C., the earliest dates of arrival for twenty-two years are: April 18, 18, 19, 19, 20, 21, 21, 22, 22, 22, 22, 23, 23, 23, 24, 24, 24, 25, 25, 26, 26, 26—average, April 23; average variation from this date, 2.1 days. The most uniform record we have in all our four hundred thousand notes on bird migration is that of the Chimney Swift at New Market, Va. The dates of arrival are: April 10, 11, 11, 12, 12, 12, 12, 14, 14, 14, 15, 15, 15, 16, 16, 16, 16, 16, 16. Average, April 14; average variation, 1.7 days. This indicates that if the record was extended indefinitely, to a hundred years or more, the probability is that the average date finally obtained would not vary more than 1.7 days from April 14.—WELLS W. COOKE, *Biological Survey, Washington, D. C.*

Ontario Bird Notes.—BRÜNNICH'S MURRE. A flight of Brünnich's Murre (*Uria lomvia*) appeared at Toronto on November 29, 1907, and for several days dead birds were picked up on the shores of Lake Ontario. They were reported in the Niagara River below the Falls and in Lake Erie on December 1, and in the Detroit River on the 4th and individuals were picked up at Woodstock, Strathroy, and other inland points in southwestern Ontario. All the birds examined had empty stomachs as has been the case in all previous migrations.

GANNET. A young Gannet (*Sula bassana*) was picked up dead, about the last week of November, 1907, by Mr. Joseph Gilmore, on his farm in the township of Wainfleet, ten miles southwest of Welland, Ont., and several miles from Lake Erie. The bird was in bad condition when found and had lost a leg, but it was preserved and is in the possession of Mr. Gilmore. Mr. Jos. S. Wallace was the first to recognize the bird and I am indebted to him for the record and photographs of the specimen.

MIGRATION OF HORNED OWLS. The winter of 1907-'08 was marked in southern Ontario by the presence of great numbers of Horned Owls; I examined twenty-four between October 31 and February 26, and as far as I was able to distinguish between them, the resident form of *Bubo virginianus* was not present, and did not appear till the second week of April, some time after the migration had ceased. The first November birds were light Arctic Horned Owls (*Bubo virginianus arcticus*), followed by others not so white, and several dark Labrador Horned Owls (*Bubo virginianus heterocnemis*). All winter the dark birds were the rarer, and the majority of the owls examined were not referable to either of the three forms, but were closer to *arcticus* than to *virginianus*, most of them having decided black and white markings and white feet. A very light male was taken at Toronto November 1, 1907, and a very dark one November 26.

GRINNELL'S WATER-THRUSH. I have in my collection three skins of Grinnell's Water-Thrush (*Seiurus noveboracensis notabilis*) taken at Toronto in May, 1897, a male and female taken on the 4th by Mr. J. Hughes Samuel and a male taken on the 7th by myself, all three from the vicinity of Ashbridge's Bay. While Ontario water-thrushes are probably intermediate between the eastern and western forms, the typical western bird has not been recorded before from Ontario.

PHILADELPHIA VIREO. A skin of the Philadelphia Vireo (*Vireo philadelphicus*) in my collection is of interest from the fact that the wings have each a bastard primary of about half the length usual in the Warbling Vireo, and while the case is not unique, it is rare enough to record. The bird was taken by Mr. J. Hughes Samuel at Toronto, September 2, 1899.—JAMES H. FLEMING, *Toronto, Ont.*

RECENT LITERATURE.

Stone on 'Methods of Recording and Utilizing Bird-Migration Data.' — In a paper of thirty pages¹ Mr. Witmer Stone discusses present methods of recording and utilizing bird-migration data. As is well known, Mr. Stone has long been active in this line of research and has given the subject of migration data thorough consideration, so that his conclusions on the subject are of special interest.

The data mainly utilized in the present paper are those collected during the last seven years by the Delaware Valley Ornithological Club, by thirty-five observers, within a ten-mile radius of the center of Philadelphia. These observations are carefully analyzed from various points of view and the results graphically shown by means of maps and diagrams, the latter, by means of curves, showing the relation of migration movements to meteorological conditions for the years 1902-1906.

In general, migration records are, for the most part, the work of single observers at isolated stations, and until very recently no attempt has been made to compare the records of several observers at practically the same locality. This was first done by Mr. Stone for Philadelphia in 1905 (Condor, 1906, pp. 88-90), and later by Prof. W. W. Cooke for Washington (Auk, 1907, pp. 346-348). In general our records give only the date of 'first arrival'; the U. S. Department of Agriculture (Biological Survey) schedules also call for arrival of the main flight or 'bulk.' Reasons are given for considering both these methods unsatisfactory, from the very nature of the case, since the first arrival may be merely a straggler, and the 'bulk arrival' a matter of estimate, subject to the element of personal equation. In commenting on these points Mr. Stone calls attention to the fact "that while a date of 'first arrival' may be perfectly accurate for the limited area covered by an observer, it would differ very materially from the earliest date of arrival for the species in a circle of five or ten miles around that observer's station," as demonstrated by the records for the vicinity of Philadelphia. Thus "the average date of arrival for a number of years, based upon the observations of a single individual, varies materially from the average date obtained by another equally accurate observer stationed a few miles distant." He concludes "that results based upon such individual records are really of but little value for comparative work, so great is the possibility of error." This is rather disheartening, not to say startling. Mr. Stone, however, suggests an obviously better method, which it is to be hoped will be systematically adopted by local bird clubs and societies. He says:

"After discrediting the value of individual records, one must naturally suggest some method of recording migration by which results sufficiently

¹ Methods of Recording and Utilizing Bird-Migration Data. By Witmer Stone. Proc. Acad. Nat. Sci. Philadelphia, 1898, pp. 128-156, July 22, 1908.

accurate for comparative work are to be obtained. This, I think, is to be found by securing a large number of observers in a limited area and by combining their results, as has been done by the Delaware Valley Ornithological Club in the vicinity of Philadelphia. If we had seven-year records kept by thirty-five individuals within ten miles of Washington, and a similar series within ten miles of Boston for comparison with the Philadelphia series, then I think we should be able to estimate with some degree of accuracy the progress of migration between these points."

Mr. Stone's discussion of 'Waves and their Components' is of special interest. It is based on the records of forty-seven common species, for which the data are fullest, and covers the years 1904-1907. He formally tabulates eleven waves, but gives the number as varying from eleven to fourteen for the spring migration, to the consideration of which the present discussion is restricted. He finds "a remarkable correspondence in the species which make up each wave. And the same 'wave' may be recognized through a number of years by its component species, though its date may vary considerably." Sometimes a movement may be interrupted by unsuitable weather and be resumed again later, making two apparent waves in one year which correspond to one in other years.... It seems then that certain species migrate together, advance stragglers of some accompanying the bulk movement of others, and that each species is ready for migration at approximately the same time each year, the exact date depending upon a favorable combination of meteorological conditions."

Mr. Stone's paper concludes with a tabulated summary of the arrival dates of 90 species for the years 1902-1907, based upon the records of 25 to 35 observers for each year, "all located within ten miles of the center of Philadelphia." The table gives under 'first arrival' the average date and extreme dates for the whole period, and under 'bulk arrival' the date for each year and the average date for the whole period. It is noticeable that the length of the interval between average 'first arrival' and 'average bulk arrival' varies markedly in different species. Thus, for 70 species for which the record is complete, the interval between 'first arrival' and 'bulk' is from 4 to 8 days in the case of 45 species, 9 to 15 days in the case of 19 species, and 16 to 30 days in the case of 6 species. The last 6 are all early migrants, and to some extent winter residents.

A vast amount of patient and painstaking labor, continued through many years, has been expended by Mr. Stone to reach the results here so clearly presented, showing that his interest in the subject is both deep and lasting; and he has well earned the hearty thanks and congratulations of all his fellow-workers in this field of research. It is to be hoped that his work and that of the other members of the Delaware Valley Ornithological Club will incite other local ornithological associations to similar effort.

We are not to infer, however, that all previous work on bird migration by individual observers has been in vain, and that our general conceptions of the average date of the spring arrival of birds based on the observations of isolated (as opposed to organized) observers is to any great extent

erroneous, or that the supposed rate of progress of migrant birds is not approximately correct, although, it must be granted, not yet grounded on satisfactory data and proper methods. The chances are that the inaccuracies due to faulty methods or insufficient data result in the main in approximately correct averages, the errors largely counterbalancing each other. Yet we have at present, it must be admitted, crude results as opposed to scientific accuracy.—J. A. A.

Birds of the New Haven Region.—‘A List of the Birds of the New Haven Region,’ compiled by a Committee, forms Bulletin No. 1 of the New Haven Bird Club (pp. 32), issued in May of the present year. The Committee consists of six members of the Club,¹ with Dr. L. B. Bishop as Advisory Committee. The region is divided into five areas, which are described as regards their topography and ornithological features. Following this preliminary matter is the annotated list, numbering 217 species, with a supplementary list of nearly a hundred species which have become extinct or are so rare as not to be ordinarily found within the region. The list is intended as “a brief and simple guide to the birds of the New Haven region,” to serve as an aid to “teachers and others interested in knowing what birds to look for and to a certain extent when and where to look for them.” It is based for the most part on the field notes of the members of the committee taken within the last few years, and thus may be regarded as reflecting present conditions. The annotations relate to the seasons of occurrence, abundance, and special haunts of the species within the region. The list will no doubt well serve its purpose, and is a commendable piece of work, as regards both its intent and execution.—J. A. A.

‘A Check List of Rhode Island Nesting Birds.’—This ‘List’² is based on records covering the period 1890 to 1908, and comprises only species known to breed in the State. These number 104, with a supplemental list of 15 others that have been reported as breeding in Rhode Island, but of which the Commissioners have been unable to find “accurate or satisfactory nesting data.” It is not assumed that no others than those admitted to the main list breed in the State, it being thought best to have the list accurate as far as it goes. Several of the species given in the second list doubtless formerly bred in the State, if they do not at the present time. The list is printed on only one side of the paper, and the annotations consist of a definite breeding record, with the authority therefor, and the situation of the nest and number of eggs, without any remarks on the abundance

¹ Freeman F. Burr, Chairman; Philip L. Buttrick, Alfred W. Honeywill, Jr., Dwight B. Pangburn, Aretas A. Saunders, and Clifford H. Pangborn.

² A Check List [of] Rhode Island Nesting Birds [with] Data [—] Published by [The Commissioners of Birds] Charles H. Remington, Chairman [Providence Co.] William H. Thayer [Bristol Co.] Alexander O'D. Taylor [Newport Co.] Edwin R. Lewis [Washington Co.] W. Gordon Reed, 2nd [Kent Co.] — [Copyright 1908] By C. H. Remington — 16 mo., ll. 26, one half-tone plate.

or manner of occurrence in the State as a whole. The nomenclature is that of the A. O. U. Check-List, brought down to include the changes adopted in the Fourteenth Supplement, published in July of the present year.—J. A. A.

Penard's Birds of Guiana.¹—The authors of the present work (which, unfortunately for English readers, is written in the Dutch language) resided for twelve years in Dutch Guiana and made a large collection of the birds of that region. They therefore write from personal knowledge of the birds, and are able to give much first-hand information of their habits, about which little has heretofore been recorded.

An introduction of about forty pages gives a general account of the local distribution of many of the species, their breeding habits and migrations. The remainder of the first volume treats, in systematic sequence, of the species, from the Grebes to the Cuckoos. There are keys to the higher groups, and descriptions of the species (in small type), followed by a more or less full account of their habits and local distribution.

Volume II, which will contain the remainder of the Picariæ and the Passeres, is now ready for the press, but (we are privately informed) will not be published until proceeds from the first volume become available.—J. A. A.

Forbes's Statistical Study of the Mid-Summer Bird Life of Illinois.²—This is a summary of some of the more general results of statistical observations made in 1907, in the southern part of the State in June, in the central part in July, and in the northern part in August, by two field observers, Messrs. A. O. Gross and H. A. Ray. The character of the field work is stated, the purpose of which is to obtain "a better knowledge of the significance of birds in the economy of nature." The statistics here presented are of much interest, as are the conclusions derived from them, which a fuller survey may or may not seriously modify. The work here detailed should be greatly extended, and carried on by a sufficient number of competent field observers to enable surveys to be conducted simultaneously in different parts of the State, so as to avoid the necessity of comparing seasonally unlike data, as in the present instance. It is work eminently well worth doing, and becomes trustworthy in proportion to its thoroughness and comprehensiveness, and which we hope to see undertaken energetically on a large scale. The present is an excellent beginning, and the

¹ De Vogels van | Guyana | (Suriname, Cayenne en Demerara) | Door | Frederik | Paul Penard | en | Arthur Philip Penard | [Volume I] Uitgave van | Wed. F. P. Penard | Paramaribo | — No date = April, 1908. Svo, pp. xliii + 588, with 173 half-tone cuts in text. Price, \$5.00; postage 30 cents additional. Orders for the work may be addressed to De Wolfe & Fiske Co., 16-20 Franklin St., Boston, Mass.

² The Mid-summer Bird Life of Illinois: A Statistical Study. By Professor S. A. Forbes, University of Illinois. Amer. Nat., Vol. XLII, No. 500, August, 1908, pp. 505-519.

generalizations here presented indicate that certain facts and conditions, of which experienced field ornithologists may feel conscious, may eventually be established on a scientific basis.

Professor Forbes points out that from the data thus far collected it is evident that there is a numerical increase in birds from the northern part of the State southward, in the ratio of 133 birds in the central part, and 181 in the southern, to 100 in the northern part. While there is undoubtedly a southward numerical increase, it must be noted that here June in the south is compared with August in the north, which is hardly a fair basis. It would hence be of interest to repeat the reconnaissance, reversing the order. This would furnish a basis for the double comparison of north with south — in June and August — and for comparing two censuses of the same region at opposite ends of the breeding season. As is well known, August is the season of moult, when birds are comparatively quiet and seek seclusion, and when, in the latitude of northern Illinois, there is generally a dearth of birds in comparison with June. Some indeed have either begun to move south, or have gathered into loose flocks and are of irregular distribution, and some even occupy different haunts as compared with June. Again, in repeating this reconnaissance in inverse order in respect to season, it would be well — almost important — to employ the same observer as before, since different observers differ greatly in the matter of expertness, and in the taking of such a census all the conditions should be as similar as possible.

The statistics presented respecting the Meadowlark are of exceeding interest, but we do not feel so sure that the inductions based thereon are satisfactory. It is of interest to know that there are many more Meadowlarks apparently in southern Illinois than in northern Illinois, but the greater abundance in pasture lands in northern Illinois in August as compared with their numbers in meadows, than in southern Illinois in June, may be in large part seasonal, since the preferred nesting grounds of Meadowlarks are meadows, while later in the season their dispersal is more general and includes pasture and other open lands as well as meadows.

If we were to make any formal criticism on Professor Forbes's paper, it would be to say that while the work here reported upon is well worth doing, and has been well planned, the data from a single season's work of two observers are too few to warrant the expectation that generalizations from them can be otherwise than premature, since observations made in August in northern Illinois, cannot be satisfactorily compared with others made in June in southern Illinois, since the two periods relate to two very different seasons in the cycle of avian activities.— J. A. A.

Warren on Birds of Northwestern Colorado.¹—An itinerary, illustrated with a map, is given of the author's route in northwestern Colorado in the spring and summer of 1907. Although the main purpose of the

¹ Northwestern Colorado Bird Notes. By Edward R. Warren. The Condor, Vol. X, pp. 18–26, Jan. 1908.

journey was to collect the mammals of the region, considerable attention was given to the birds, as attested by the present list of 93 species collected or observed during the trip, mainly in Grand, Routt, and Eagle counties. Among the interesting records is that of a small colony of Bobolinks (*Dolichonyx oryzivorus*) at Steamboat Springs, in the eastern part of Routt County.—J. A. A.

Howell on Winter Birds of Northern Louisiana.¹—This is a briefly annotated list of about 70 species and subspecies, and adds 7 to the list of Louisiana birds. It is especially welcome as furnishing definite information respecting the distribution and abundance of the winter birds of a little known district.—J. A. A.

Birds of Yellowstone Park.—In the Annual Report of the Superintendent of the Yellowstone Park for 1907 (pp. 15–23) Dr. T. S. Palmer contributes the results of his observations on the birds of Yellowstone Park made during parts of August and September, 1907. There are formal notes on about seventy species. Suggestions are made for the increase and better protection of the birds about the hotels and permanent camps by the prohibition of cats and by providing nesting boxes and shallow pans of water where the birds can bathe and drink.—J. A. A.

Carriker on New Birds from Costa Rica.²—The new species are *Formicarius castaneiceps* and *Sporophila crissalis*, and seven other species are recorded for the first time from Costa Rica.—J. A. A.

Mrs. Miller's 'The Bird Our Brother.'—The purpose of the present work³ is eminently commendable, and its selections are in the main from excellent sources, for it is mainly composed of extracts from a multitude of writers, woven together with such comment as Mrs. Miller's wide experiences with birds and her sympathies suggest. The book is a popular exposition of bird traits "intended solely for the 'general reader'.... It is simply an earnest attempt.... to present him [the bird] as an individual, a fellow pilgrim in this fair world of ours." It consists of fourteen chapters, treating of 'individuality,' 'intelligence,' 'language,' 'altruism,' 'education,' 'affection,' 'courtship,' 'home,' 'amusements,' 'means of defense and attack,' 'odd ways,' 'equipment,' 'usefulness to us,' and 'conclusion.' These headings will serve to give a general idea of the method of treatment,

¹ Notes on the Winter Birds of Northern Louisiana. By Arthur H. Howell. Proc. Biol. Soc. Washington, Vol. XXI, pp. 119–124, April 11, 1908.

² Brief Descriptions of some new Species of Birds from Costa Rica and a record of some Species not hitherto recorded from that Country. By M. A. Carriker, Jr. Ann. Carnegie Museum, Vol. IV, pp. 301, 302, April 1, 1908.

³ The Bird Our Brother [A Contribution to the Study of the Bird as He is in Life] By Olive Thorne Miller [Seal] Boston and New York [Houghton, Mifflin and Company] The Riverside Press, Cambridge [1908—16 mo., pp. xii + 331. \$1.25 net.

and the wide range offered for quotations on the several topics mentioned. An appendix containing 285 titles referred to by numbers in the text, gives the sources drawn upon. Naturally the same author is cited in many different connections, so that some twenty of the principal sources form the basis of nearly two hundred of the references.

It may seem unkind to say that a careful reading of this very interesting book has suggested a modification of the subtitle, to read, in place of "the bird as he is in life," the bird as the author would have him in life, since none of the bad traits of birds,— it must be admitted that all birds are not wholly angelic, but share with man some of his bad traits as well as all his good ones,— seem to be passed over in silence or with a statement to the effect that the species has been woefully slandered by "sensational writers." Very few birds are really more injurious than beneficial to man, and these are indirectly rather than directly so, through their destruction of other birds of greater use to man than they are themselves. The author's lapses, which are few, are on the side of friendship to the bird, and do not detract materially from the usefulness of her book, which, besides affording pleasant and instructive reading to a host of bird lovers, will exert a much needed influence in behalf of the birds.— J. A. A.

CORRESPONDENCE.

Membership Conditions in the A. O. U.

EDITORS OF 'THE AUK':—

Dear Sirs:— I question the wisdom of the rule or by-law of the A. O. U. which limits the number of "fellows" and the number of "members." It seems to me that this is unjust, unreasonable and un-American from every point of view; though there may be good reasons for it which I do not understand, certainly none have ever come to my notice. It seems to me that when the work of a "member" has reached a certain standard of importance he should be advanced to a "fellow"— this standard, of course, to be judged and determined by the Board of Fellows who elect. From my point of view there are several men in the class of "fellows" whose work, whose renown or whose service to ornithology is far inferior to that of several "members" who cannot be advanced to "fellows" because that class is full, and I ask if there is any justification in a limited class of "fellows" sufficient to offset so unjust and unsatisfactory a condition as this appears to be?

Limiting the class of "members" also works a like injustice. The class of "associate members" is open to anyone who has \$3.00 per annum

to pay. He is not required to know so much as a chickadee from a crow. It is the first step,—in short the primary class of our National Ornithological Association.

Now why should an "associate" be barred from an advance to the "members" class after his services to the cause of Ornithology have become recognized as of some degree of importance sufficient to entitle him to advancement? I doubt if anyone can show but that there are "associate members" just as much entitled to be advanced to "members" as some of those who have received such advancement? Is it a good policy to keep a man years in the "associate" or primary class waiting for a vacancy in the "members" class, and when a vacancy occurs, he or his friends must put up a fight for it and if he wins it is at the expense of some others whose claim to advancement is as good or better than his own? That is why I resigned from the A. O. U. after a six or seven years' membership in the primary grade. I felt that I had been there long enough, yet to be advanced meant that I stood in the way of someone more entitled to it than I.

I would say make the standard of "fellows" and "members" as high as you like but leave room for all who attain it.

Yours very truly,

JOHN LEWIS CHILDS.

Floral Park, N. Y.

July 15th, '08.

[Mr. Childs, in transmitting the above letter for publication, expressed the desire to have it followed by such comment as the editors might wish to make. This gives an opportunity for explanations that may interest others who share Mr. Childs's point of view. He says, very truly, that there are men in the class of Fellows whose services to ornithology are far inferior to those rendered by many who are in the class of Members, a condition of affairs which seems to him as very unjust and unreasonable, though, he adds, there may be good reasons for it which he does not understand.

Mr. Childs objects to a limited membership; but it has long been recognized by societies of all classes—in art, literature and science—that membership is sought for and valued in direct proportion to its numerical limitations. Mr. Childs would have eligibility to Fellows in the A. O. U. determined by a "Board of Fellows," but such eligibility can be determined only by the establishment of a standard, and experience has long shown that a standard can be established *and maintained* only by declaring that certain classes of membership shall not exceed a certain number.

The condition complained of by Mr. Childs had its origin long ago, and is due to contingencies that were not foreseen. The American Ornithologists' Union was organized twenty-five years ago. The tremendous advancement in all departments of science during the last quarter-century is well known, not only in respect to discoveries and methods of work, but in respect to the number and training of those engaged in scientific

research. One unfamiliar with conditions in ornithology in this country twenty-five years ago cannot appreciate the greatness of the change. In consequence of this change the standards of admission to the higher grades of membership, not only in the A. O. U., but in other scientific societies with limited memberships, have also been raised. Twenty-five years ago the number of what would now be considered expert ornithologists was very small, and men who would not now be considered eligible to the present class of Members were accepted readily for the higher grade, being then, without question, among the fifty leading ornithologists of America.

It could not, however, be foreseen that men who were then promising and enthusiastic students of birds would later become absorbed in some other lines of research or that others had practically completed their career as ornithologists.

Aside from the purely honorary grades of membership, the American Ornithologists' Union was originally divided into Members (now Fellows) and Associates, the former limited to fifty, the latter numerically unlimited. Fifty for the former, in which there has always been one or more vacancies, seems still a reasonable limit, if membership in this class is to have any significance. Since then a grade of Members, between Fellows and Associates, has been established, limited to one hundred and, as in the case of Fellows, this limitation carries its implied distinction, a distinction which would be vague or wanting were the number unlimited.

It is hardly just to apply present day standards to conditions that prevailed a quarter of a century ago. Nor is the A. O. U. exceptional in regard to the conditions about which Mr. Childs offers complaint. Exactly the same conditions obtain in our own National Academy of Sciences and in Foreign Academies, where the candidates for membership far exceed (sometimes by 75 per cent.) the vacancies, and greatly excel in scientific attainments many who have long been honored members, and who were the peers of their colleagues when elected.—EDD.]

NOTES AND NEWS.

J. V. BARBOZA DU BOCAGE, an Honorary Member of the American Ornithologists' Union, died recently at his home in Lisbon, at the age of 84 years. For many years he was Professor of Zoölogy in the Royal Polytechnic Institute and Director of the National Zoölogical Museum at Lisbon. He was especially known for his investigations in African ornithology, to which he contributed a long series of papers.

His '*Ornithologie d'Angola*,' published in two parts (1877 and 1881) is a work of about 600 pages, with 10 colored plates, and gives a very complete résumé of the avifauna of the Portuguese Possessions in Africa. He also wrote numerous papers on African mammals and reptiles. It is

with the literature of African ornithology, however, that his name is most intimately interwoven.

FRANCIS HUNTINGTON SNOW, an Associate of the American Ornithologists' Union, died at Bellfield, Wisc., September 20, 1908, at the age of 68 years. He was born in Fitchburg, Mass., June 29, 1840, was graduated from Williams College in 1862, and from the Andover Theological Seminary in 1866. He was a member of the faculty of the State University of Kansas from the founding of the University in 1866, became president of the faculty in 1899, and was chancellor from 1890 to 1901. He filled the chair of mathematics and natural science from 1870 to 1890, and since 1901 that of organic evolution, systematic entomology and meteorology. He received the degree of Ph. D. from Williams College in 1881, and that of LL. D. from Princeton in 1890. The Snow Hall of Natural History at the University of Kansas was named in his honor. He was well known for his contributions to systematic and economic entomology, and for his interest in Kansas ornithology. He published his first catalogue of Kansas birds in 1872—the first list of the birds of the State—and revised editions of it at frequent intervals, the fifth and last appearing in 1903 (reviewed in this *Journal*, XX, 1903, p. 317). In this last edition he excluded all species which could not be verified as birds actually captured in Kansas since 1886, the list as thus restricted including 342 species and subspecies. The following year, however, he added (in 'The Auk') five others; in 1906, two more; and in 1907 ten more, raising the total to 359. In addition to his own original contributions in various lines of natural history, he did much through his training of students at the University to promote biological research.

A NEW department has recently been established at the University of California to be known as the California Museum of Vertebrate Zoölogy. This has been made possible through the generosity of Miss Annie M. Alexander, of Oakland, Cal., who is an alumnus of the University and deeply interested in the vertebrate fauna of North America, and especially in that of California, which is thus far poorly represented in the museums of the State. A feature of the new museum will be the accumulation of material for original research, the collection of ecological data, and the representation of leading types by mounted groups. It is planned to have at least two skilled collectors in the field in the interest of the Museum. The University will provide a suitable building for the reception and installation of the material. Dr. Joseph Grinnell has been selected as Curator, and active field work was begun early in the present year. This undertaking cannot fail to yield results of great importance in a field as yet very imperfectly developed.

A PRACTICAL guide for those who wish to protect wild birds and attract them to their grounds has been issued by Witherby & Co., London, under

the title 'How to Attract and Protect Wild Birds.' It is an English translation of Martin Hiesemann's "*Der gesammte Vogelschutz*," which was prepared with the assistance of Baron von Berlepsch, and faithfully represents his ideas and the results of his long-continued experiments at his experiment station at Seebach. It is illustrated with views of different kinds of nesting-boxes, methods and means of feeding birds in winter, shelter-woods for birds, etc., and makes a small book of about one hundred octavo pages. It is based on careful research, and is beyond question the best manual of the subject extant. The publishers have arranged to supply the work to American bird protectors through the National Association of Audubon Societies, 141 Broadway, New York City.

THREE new Reservations for the protection of birds were established during August, 1908, by executive order of President Roosevelt, at the request of the National Association of Audubon Societies. These are: (1) The Key West Reservation in the Gulf of Mexico, including all of the keys and islands of the Florida Keys group. (2) The Klamath Lake Reservation in Oregon and California, including Lower Klamath Lake and its islands and contiguous marsh and swamp lands. (3) Lake Malheur Reservation, including Lakes Malheur and Harney and their connecting waters. The setting aside of these extensive reservations is a most important step for the preservation of our rapidly decreasing water-fowl, since they embrace some of the most extensive and important breeding stations of these birds within the control of the United States.

THE THIRD ANNUAL MEETING of the National Association of Audubon Societies will be held at the American Museum of Natural History, New York City, on October 9, 1908, at 2 P. M., for the election of officers and the transaction of such other business as may be necessary. The term of office of six directors, class of 1908, expires at this meeting, and their successors will be chosen. These directors are Ruthven Deane, Mrs. C. Grant La Farge, Frank M. Miller, Theodore S. Palmer, Abbott H. Thayer, and John E. Thayer. At the close of the business meeting an address will be given by Mr. William L. Finley, the Northwest Field Agent of the Association, on the results of his summer's work, under the title, 'On the Trail of the Plume Hunters.'

THE Twenty-sixth Stated Meeting of the American Ornithologists' Union will be held in Cambridge, Mass., beginning on the evening of November 16, 1908. The evening session will be for the election of officers and members, and for the transaction of routine business. Tuesday and the following days of the session will be for the presentation and discussion of scientific papers and will be open to the public. Members intending to present communications should forward the titles to the Secretary, Mr. John H. Sage, Portland, Conn., so as to reach him not later than November 12.

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ERRATA.

Page 67, line 9 from bottom, for Richmond County read Richland County.

“ 172, last line above the footnotes, for 1824 read 1842.

“ 238, first line, for ‘booted’ read feathered.

“ 312, line 11 from bottom, for August 22, 1904, read August 31, 1904,
and August 4, 1906.

For additional corrections see page 250.

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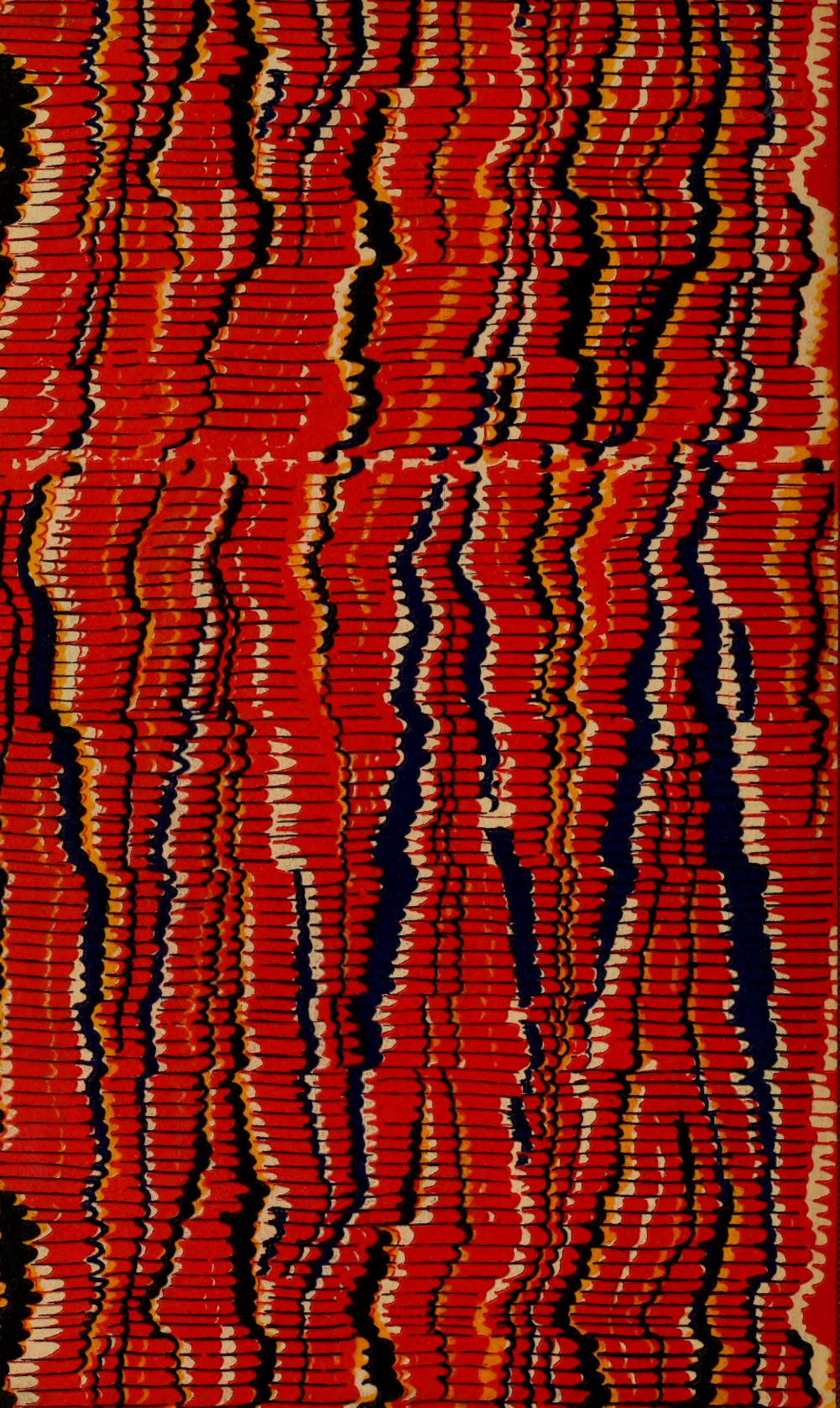
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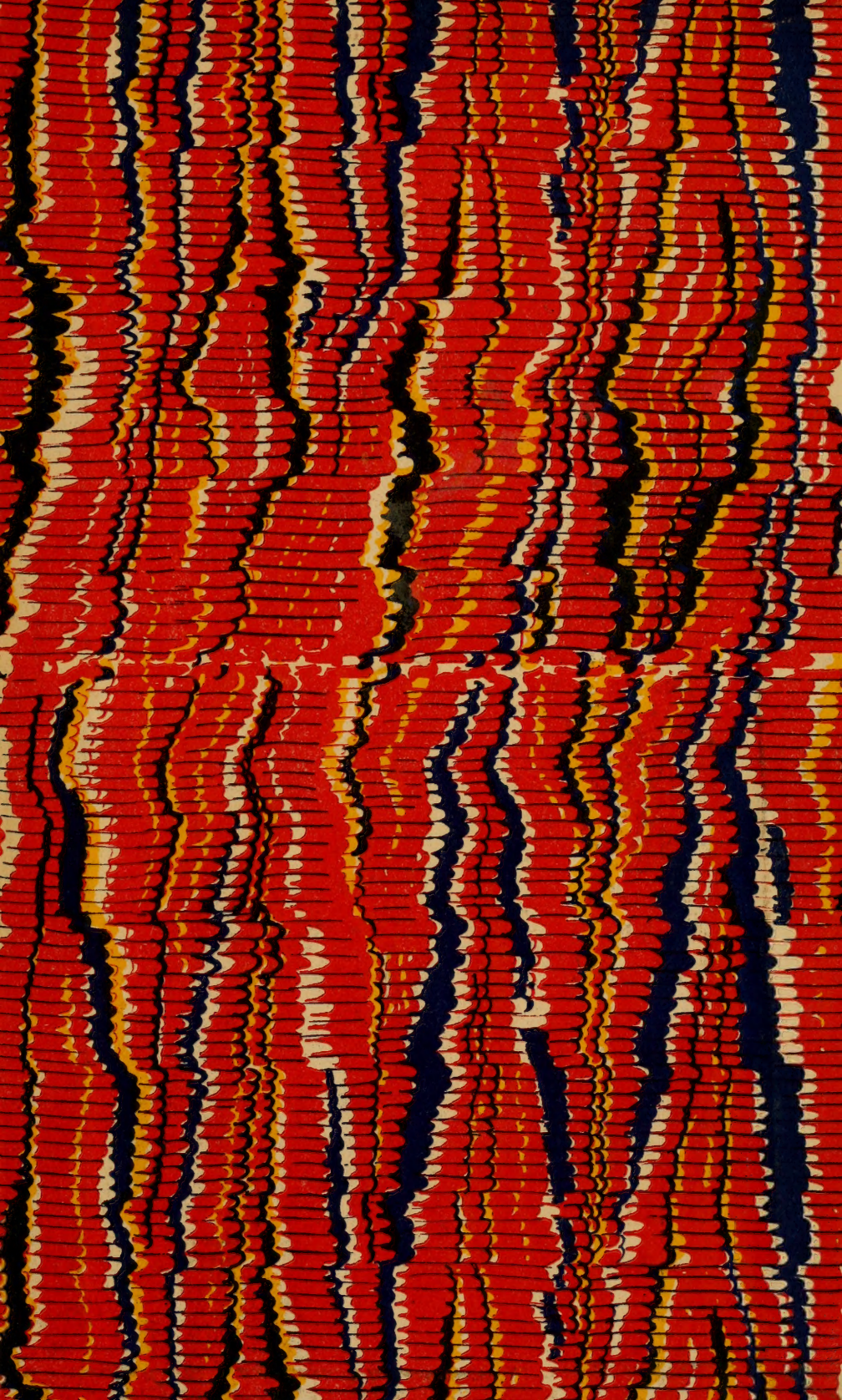
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